

# Dr. Allen E. Puckett Elected to Company's Board of Directors

Dr. Allen E. Puckett, Chairman Emeritus of Hughes Aircraft Company, has been elected to the General Dynamics Board of Directors.

Puckett held several important management positions at Hughes since 1949, culminating in his appointment as Chairman of the Board and Chief Executive Officer in November 1978. He served in this position until his retirement in April 1987.

The 68-year-old Ohio native is a prominent aerospace authority and has served on many advisory groups concerned with the role of science in the nation's defense and space efforts and with the management of high-technology industry in today's society.

Among the many committees on which he has served are the Army Scientific Advisory Panel, the Defense Science Board, the Army Ballistic Research Laboratories' scientific advisory committee, the Naval Aviation Industrial Council and the Subcommittee on Automatic Stabilization and Control of NASA's Committee on Aerodynamics and Space Program Advisory Council.

Puckett has also been a chairman of the Aerospace Industries Association and is a member of the AIA senior advisory board. He has served as a consultant to many industry and government groups, including the operations evaluation group of the Chief of Naval Operations and the President's Scientific Advisory Committee.

He received a bachelor's and a master's degree from Harvard University. He obtained a doctorate in aeronautical engineering from the California Institute of Technology. He has authored many technical papers on high-speed aerodynamics and is co-author of the book, "Introduction to Aerodynamics of a Compressible Fluid."



Puckett

## GENERAL DYNAMICS

Pierre Laclède Center, St. Louis, Missouri 63105

Address Correction Requested

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SAN DIEGO AEROSPACE MUSEUM  
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GENERAL DYNAMICS

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January 1988

## Team of General Dynamics-McDonnell Douglas Selected to Develop the ATA for the U.S. Navy

The U.S. Navy has awarded a \$4,379,000,000 contract to the team of General Dynamics and McDonnell Douglas for development of the Advanced Tactical Aircraft (ATA).

The ATA, designated the A-12, will replace the Navy's current carrier-based, all-weather medium attack aircraft, the A-6.

"We are pleased to have been selected by the Navy to develop and test its new Advanced Tactical Aircraft," said Stanley C. Pace, Chairman and Chief Executive Officer of General Dynamics, and Sanford N. McDonnell, Chairman and Chief Executive Officer of McDonnell Douglas, in a joint statement released late last month.

The Hon. Jim Wright, Speaker of the U.S. House of Representatives, who represents the Fort Worth area, wrote the following about the ATA program in a congratulatory telegram to Charles A. Anderson, Vice President and Fort Worth General Manager:

"The ATA is the most exciting program in our defense plans and will give the Navy pilots the ability to carry out their strike missions and survive. You and your people are to be commended for putting together a design and a program that will make this possible."

"The ATA is so important to the country and to Fort Worth that we are all enormously proud of your folks for being chosen on the winning team."

Navy plans call for an initial operating capability for the ATA in the mid-1990s. As the replacement for the A-6, the ATA will exhibit significant improvements in aircraft performance, particularly in survivability. Aircraft design and development are being done at the McDonnell Aircraft division in St. Louis and at Fort Worth, where the Principal Program Office, staffed by both companies, is located.

John P. Lamers, Division Vice President at Fort Worth, is Principal Program Manager for the General Dynamics-McDonnell Douglas team.

The companies have an agreement under which the work will be shared equally during development and initial production, with parts and assemblies made in St. Louis and Fort Worth. In addition, more than 40 major suppliers located in 35 states will be working on the program.

Long-range Navy procurement plans call for competition between General Dynamics and McDonnell Douglas during the production phase of the program.

## Hawes Is Named to a New Exec. V.P. Position; Keel Becomes Valley Systems General Manager

Ralph E. Hawes, Corporate Vice President and General Manager of Valley Systems Division, has been named to the new position of Executive Vice President, Missiles and Electronics. He will report to Herbert F. Rogers, President and Chief Operating Officer, and will have the responsibility for the Convair, Electronics, Pomona and Valley Systems divisions.

Named to succeed Hawes as Corporate Vice President and General Manager of Valley Systems is Michael C. Keel, who has been Division Vice President and Program Director - Cruise Missile at Convair.

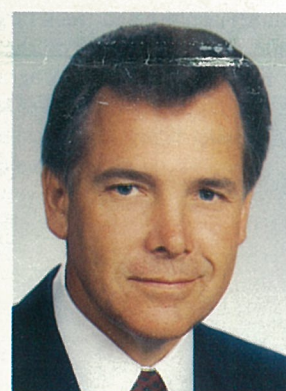
In making the announcement, Chairman and Chief Executive Officer Stanley C. Pace said that "the alignment of the company's missiles and electronics operations under the direction of Ralph Hawes represents a logical move in the light of future business objectives and opportunities."

Hawes, 56, had headed Valley Systems in Rancho Cucamonga, Calif., since October 1985 following eight years as Vice President and General Manager of the Pomona Division. He had joined General Dynamics in 1956 at Pomona, serving in a number of increasingly responsible management positions including Vice President, Research and Engineering.

Hawes received an electrical engineering degree from Clarkson College of Technology in 1955 and a master's degree in engineering from the University of California at Los Angeles in 1969.



Hawes



Keel

Keel, who succeeds Hawes at Valley Systems, has been in his present post at Convair since 1982. He joined the company in 1963 at Pomona after receiving a degree in electrical engineering from California State University. He later received a master's degree in systems engineering from West Coast University.

Keel, 47, held a number of increasingly responsible positions in Pomona's engineering department and Standard Missile program office. In 1977, he was named Division Vice President and Program Director - Standard Missile. He later became Division Vice President and Deputy General Manager at Pomona before moving to Convair in late 1982.

## Air Force Secretary Cites Company Ad On Fort Worth Flags

The following is the text of a letter that Stanley C. Pace, Chairman and Chief Executive Officer, received recently from Edward C. Aldridge Jr., Secretary of the Air Force.

Dear Mr. Pace:

I just wanted to drop off a quick note to let you know how pleased I was with an advertisement I saw in the November 24th *Washington Post*. The ad describes how General Dynamics employees pitched in to put American flags in their factory.

Your ad was right on target with something I have always believed — all of us, civilians, uniformed military and industry, work as a team to defend our country. It means a lot to those of us in the Air Force to know your people have this kind of dedication and spirit.

Sincerely,  
E.C. "Pete" Aldridge, Jr.

**Editor's Note:** The subject advertisement is part of the campaign that General Dynamics launched in mid-1987. It is one of a series highlighting company values and priorities. The ads have also been published in several issues of *General Dynamics World*. Another ad appears on Page 7 of this issue.

## Watch Your Television

The company will kick off a television advertising campaign with spots that will be broadcast on nine ABC affiliates during the Winter Olympics Feb. 13th through 28th.

General Dynamics commercials will be aired in Dallas-Fort Worth; Detroit; Hartford, Conn.; Los Angeles; Providence, R.I.; San Diego; St. Louis; and Washington, D.C. Company commercials will also appear during "Election Watch '88" broadcast on Cable News Network (CNN) and CNN Headline News Feb. 22nd through 24th.

## Electric Boat Awarded Contract for 15th Trident In First Competition With Another Shipyard

The U.S. Navy on Jan. 6th awarded a \$644 million contract to Electric Boat to build the nation's 15th Trident submarine.

It was the first time a contract for a Trident was open to competition. Newport News Shipbuilding was the losing bidder. The newest Trident is scheduled for delivery from the Groton, Conn., shipyard in July 1994.

News of the award was greeted with statements of praise and compliments from government officials.

The Hon. Lowell P. Weicker, United States Senator from Connecticut, said, "The continuation of this work in Groton is a recognition that quality work is always a winner."

The Hon. John G. Rowland, United States Representative from Connecticut, said, "Electric Boat can go head-

to-head with another giant military contractor when put to the test."

The Hon. Samuel Gejdenson, United States Representative from Connecticut whose district includes Groton, said the award "brings an end to the . . . idea of dual-sourcing the Trident program." He said he hoped the Navy would in the future consider a "more rational approach to contracting."

For months prior to the award, much media attention had been given to the possibility that Electric Boat would no longer have a monopoly on Trident submarines and would have to share in its contracts with another shipyard, resulting in a 50 percent reduction of the Electric Boat work force.



# Corporatewide Participation in Savings Bonds Campaign Sets Record

The U.S. Treasury Department has named General Dynamics to its 1987 Honor Roll for achieving a record-breaking 89 percent participation by its employees in the purchase of U.S. Savings Bonds. General Dynamics ranked fifth in the nation in 1987; in 1986, the corporation ranked 10th.

"While we are proud of this national achievement, the Treasury's figures only tell part of the story," said Oliver C. Boileau, Vice Chairman. "The Treasury only keeps statistics on operating units of 5,000 or more employees."

The record-breaking results were led by the Corporate Office with 98.5 percent, Space Systems Division with 98.4 percent and Electronics at 95 percent. Those were followed closely by Fort Worth, 93.5 percent; Convair, 93 percent; Valley Systems, 91.6 percent; and Pomona, 86.2

percent.

"These outstanding results," Boileau said, "are highly visible evidence of our continuing commitment to be leaders in whatever we undertake. Our thanks to all the employees who worked so very hard on the division campaigns to achieve these records."

The top 15 companies and agencies are:

1. E-Systems	99%
2. Bell South Corporation	96%
3. The Boeing Company	96%
4. Johnson & Johnson	93%
5. General Dynamics	89%
6. NY NEX	89%
7. Martin Marietta	87%
8. Lockheed	86%

9. Mitre	83%
10. Dept. of Housing and Urban Development	79%
11. Bell Communications Research	72%
12. U.S. West	71%
13. Northrop	71%
14. Tennessee Valley Authority	71%
15. Chemical New York	70%

Meanwhile, the Treasury has announced that beginning Feb. 1st, \$50 and \$75 denomination bonds will no longer be offered to new participants in the payroll savings plan. For new participants, the minimum denomination will be \$100. Those currently enrolled in the payroll savings program purchasing bonds at the lower denominations may continue to do so.

# Tank Gunners of the Future Will Not Have to Track Their Targets

By Donald L. Gilleland

Because of innovative work being done by the U.S. Army, General Dynamics and Texas Instruments, smarter weapon systems will make it possible for future tank gunners to isolate and track targets automatically before enemy tanks become visible to the naked eye. The gunner will no longer have to continue squinting into an eyepiece and slew the turret around to track a target before firing the 120mm cannon for a kill. The fire control system will track the target automatically.

On Dec. 10th, a team of experts from Land Systems, Texas Instruments and the U.S. Army used an M1A1 Abrams tank to successfully demonstrate a new advanced electronics system that will substantially improve the cueing and tracking capability of the fire control system in the Abrams. The demonstration was conducted for the Department of Defense (DOD) at the Chelsea Proving Grounds near Ann Arbor, Mich.

With increasing reliance on conventional weapons, DOD policy is to use high technology to overcome numerical disadvantages on the battlefield. The DOD Very High Speed Integrated Circuits (VHSIC) Program laid the groundwork for integrating into the fire control system of the M1A1 Abrams tank a VHSIC-based automatic target tracker subsystem. This new technology enables the fire control system to operate semiautomatically, helping the gunner acquire and track targets. This in turn reduces the time and effort to fire on the enemy.

Early in the VHSIC program, manufacturers developed silicon chips with a feature size of 1.25 microns allowing processing times much faster than conventional computers. Follow-on phases developed chips with a feature size of 0.5 microns that will result in even faster processing.

To expedite VHSIC development and take advantage of the high processing speeds, DOD sponsored a number of demonstrations to move the technology out of the laboratory and into weapon systems. The latest demonstration included a Texas Instruments-developed VHSIC-based brassboard automatic target tracker, using their 1750A VHSIC data processing module and VHSIC array processing module. Land Systems, with support from Texas Instruments, integrated this new technology into an M1A1 Abrams tank fire control system.



**Successful Demonstration.** Larry Yung (left), Systems Engineer for the Army Research, Development and Engineering Command, discusses with Col. John Longhauser (right), U.S. Army Tank-Automotive Command Program Manager, M1A1 Tank, practical applications of the DOD Very High Speed Integrated Circuits (VHSIC) program to the M1A1 Abrams tank. E.D. Maynard (center), Director, DOD Computer and Electronics Technology, is responsible for development of the VHSIC program.

With this integrated VHSIC system, symbols are displayed in the gunner's eyepiece identifying possible targets as they enter the gunner's field of view and are sensed by the gunner's primary thermal imaging sight. The gunner then identifies the target to be engaged, and the tank gun system automatically tracks it. All that's left for the gunner is to fire the 120mm cannon.

The successful demonstration of this capability included use of a General Dynamics test tank equipped with a Texas Instruments VHSIC-based brassboard automatic target tracker to cue and track another tank and truck as multiple targets. Two television screens were provided for visitors to monitor as the targets were acquired and tracked.

Observers included E.D. Maynard, Director, DOD Computer and Electronics Technology; Col. William Freestone, Director for Technology Insertion, DOD

Computer and Electronics Technology; John Courtright, Secretary of the Army Office, Director of Information Systems for Command, Control, Communications and Computers; Brig. Gen. Joseph Raffiani Jr., Commanding General, Army Research, Development and Engineering Center; and Col. John Longhauser, Program Manager, M1A1 Tank, U.S. Army Tank-Automotive Command.

The M1A1 Abrams tank with its digital computer, laser rangefinder, thermal imaging system and stabilized turret already can shoot accurately on the move, day or night. However, this state-of-the-art VHSIC technology will improve the tank's lethality and survivability through increased signal and data processing speeds. At the same time it requires less space and electrical power than today's systems and gives soldiers an improved capability to help them defeat a numerically superior enemy.

# Texas Commission Honors Fort Worth for Opportunities for the Blind

The Texas Commission for the Blind recently cited Fort Worth as the Employer of the Year for 1987.

The annual award recognizes companies that have "provided exemplary employment opportunities to blind and visually impaired Texans," said Dr. Bob Peters, regional representative of the commission.

Fort Worth has 137 employees who are visually impaired or blind, noted Charles A. Anderson, Vice President and Division General Manager, when he was presented a plaque by Dr. Peters.

"Among the blind and visually impaired, there is a national unemployment rate of 80 to 85 percent," Dr. Peters said in a brief ceremony.

"Your giving these visually impaired and blind persons

employment has done much to their lives, has given meaning and respect to them and has put them in the ranks of the employed," he said. "What you have done is something with immeasurable value . . . your contributions are vitally important."

Anderson praised the quality of work demonstrated by the visually impaired and blind at the division.

"We don't ask whether an employee is sighted, has partial vision or has 20/20 vision," he said. "We only ask that he or she do the job to the best of his or her ability."

"And we have found that the people you are honoring us about today are exceptional workers who are interested in turning out work of the highest caliber," Anderson added.

One of the division employees in the audience during the presentation was Bob Barnes, an electronics engineer who is blind.

Barnes, who has been with the division about eight years, was praised by Anderson as "being one of our best employees. He is a real team member."

Barnes, in turn, noted that the division had to buy special equipment so he could work with his computer.

"You have given me, and others like me, an employment opportunity and that is important," Barnes said. "I think I am making an important contribution to the team and I am proud of that contribution."

# Fort Worth Is Among Companies Selected for Close Air Support Aircraft Design Studies

Fort Worth received a contract on Jan. 8th for design studies of a new close air support (CAS) aircraft for the U.S. Air Force.

The Air Force Aeronautical Systems Division (ASD) awarded contracts totaling \$4.9 million to six major aircraft contractors: Fort Worth, Boeing, Lockheed (Georgia), McDonnell Aircraft Company, Northrop and Rockwell.

Maj. Hal L. Hastings, ASD's Deputy for Development Planning and manager of the program, said the objective is to investigate a broad range of design alternatives for an aircraft to replace the aging A-10 close air support aircraft. Present plans call for modernizing the attack force, beginning as early as 1992.

Under the program, designs will be developed for aircraft to provide tactical air support for ground forces.

Contractors will provide data for review in about four months. Major Hastings said concepts will be judged for mission effectiveness, performance, cost, survivability and reliability. The Air Force assessment is expected to be completed this year.

An F-16 configuration is one of several alternatives that have been discussed as a possible A-10 replacement.



# Key Appointments Of Executives Made By Convair, Pomona



Thompson

Neal

Promotions to Vice President have been announced by the Convair and Pomona divisions.

**J. Frank Thompson** has been appointed Division Vice President and Program Director-Tomahawk Cruise Missile Programs at Convair. He was one of the earliest members of Convair's Tomahawk team and has served in a number of key assignments as Director of the Surface and Sub-Launched Programs, Dual Source Program, Advanced Applications and Logistics and Maintenance. Most recently, he had been Program Director-Modular Standoff Weapon (MSOW) Program.

**William H. Neal** has been named Division Vice President and General Manager of the Camden, Ark., facility. His most recent position was Second Source Programs Director at Camden. He joined Pomona in 1966 and advanced through a variety of electronics engineering positions until his move to Camden in 1982. He began his service at Camden as Director of Sparrow Missile Manufacturing and later became Director of Engineering.

# Undersea Warfare Center Is Established In Washington, D.C.

The company has formed an Undersea Warfare Center (UWC) based in Washington, D.C., and headed by Gerald A. Cann, Staff Vice President-Undersea Warfare Center. The center will pursue emerging business opportunities in advanced submarine sensor systems and antisubmarine warfare concepts/technologies.

Since 1985, Cann was President of Gerald A. Cann, Inc., a management and technical consulting firm located in McLean, Va. From 1979 to 1985, he was the Principal Deputy Assistant Secretary of the Navy for Research, Engineering and Systems. He also was previously employed by TRW Systems Inc. and AMF Inc.

Cann has had many articles published in Journal of Defense Research and other periodicals. He has received many honors, including the Distinguished Executive Award presented by President Carter in 1980 and the Navy Distinguished Civilian Service Medal in 1985.

Cann, 56, is a U.S. Army veteran. He received a Bachelor of Arts degree in Geology/Geophysics from New York University in 1953.

Chairman Stanley C. Pace said the opening of the center follows a recently completed internal Government Business Task Force study, which identified developing business opportunities for the company.

A General Dynamics Defense Initiatives Office (DIO) was also established in Washington in October as a result of the study. The DIO is responsible for overseeing the company's Government Aerospace group activities in Strategic Defense, Air Defense and Conventional Defense initiatives.

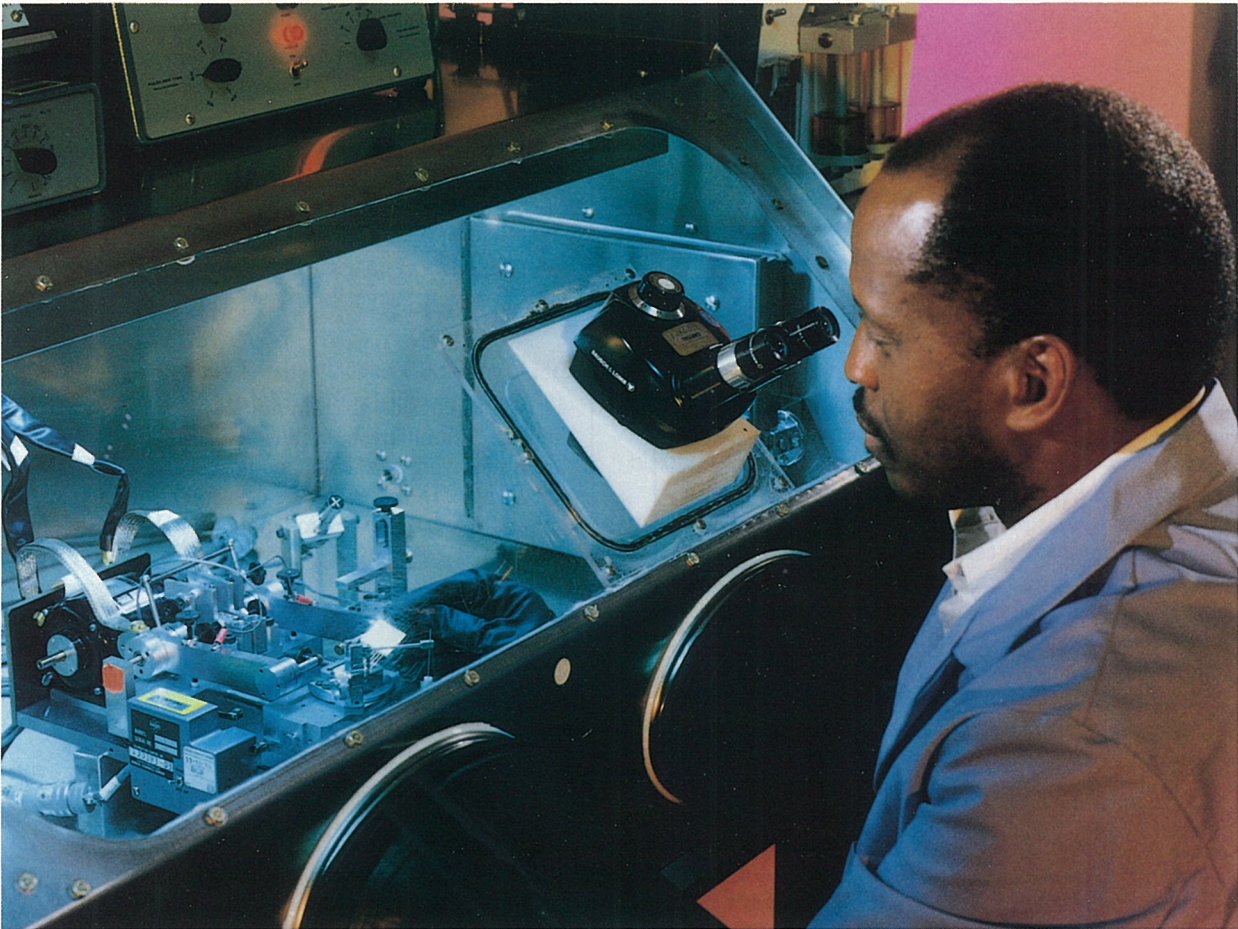
# Dupree Completes Program

Michael J. Dupree, Director of GDSC Detroit Operations, recently graduated from the Harvard Business School Program for Management Development. The three-month program was sponsored by General Dynamics Services Company.

Dupree is responsible for the overall management of GDSC's Egyptian Tank Plant program, as well as the manufacturing technical assistance and training programs in Korea and Taiwan and the Saudi Arabia M60A1-A3 upgrade proposal effort.

## Updated List of General Dynamics Ethics Program Directors

Division/Subsidiary	City Location	Ethics Program Director	Phone Number
(* = Hotline)			
Nationwide	St. Louis	Kent Druyvesteyn	800-433-8442*
Cessna	Wichita	Mark Bagley	316-946-7880*
Convair	San Diego	John C. Barrons	619-573-8120*
Corporate Office	St. Louis	Kent Druyvesteyn	314-889-8456*
	Washington	Leland B. Bishop	703-553-1343*
Data Systems	St. Louis	William E. Tucker	314-851-8906*
	Camden	John Brown	501-574-4220*
	Fort Worth	Robert B. Gardner	817-762-2333*
	Newport	Edwin A. Coolbaugh	401-848-8579
	Norwich	James M. Cleary	203-823-2700*
	Pomona	William E. Kirke	714-868-6620*
Electric Boat	San Diego	Roger E. Barnes	619-547-4682*
	Sterling Hgts.	Stanley J. Kukla	313-825-8795
	Groton	William A. Miller	203-441-8000*
	Avenel	Robert L. Wylie	201-636-0155*
	Charleston	Joseph Churma	803-553-4850*
	Quonset Point	Roland J. Plante	401-268-2705*
Electronics	San Diego	M. Ray Reynante	619-573-5384*
Fort Worth	Fort Worth	Jerry A. Sills	817-777-1400*
	Abilene	Jon A. Cohen	915-691-2131*
Freeman United Coal	Chicago	James T. Ryan	312-263-3933*
GD Services	St. Louis	Lewis A. Corwin	314-851-8997*
Land Systems	Warren	Charles J. Stieber	313-825-5888*
	Lima	Alan E. Frysinger	419-221-8555*
	Scranton	John A. Rhoads	717-876-5797*
Marblehead Lime/ Material Service	Chicago	Edward K. Wilverding	312-263-3931*
	Pomona	Roy E. Harris	714-868-2001*
Quincy	Camden	Ted C. Bernard	501-574-4446*
	Navajo	Darrell L. Springer	602-729-6523*
	Quincy	Carter W. Eltzroth Jr.	617-786-8300
Space Systems	AMSEA	James F. O'Hearn	617-786-8300 ext. 702
	San Diego	Richard L. Neal	619-573-8367*
	Cocoa Beach	Warren Holley	305-730-0185*
	Vandenberg AFB	George Mees	805-865-8072*
Valley Systems	Rancho Cucamonga	Donald D. Skinner	714-945-7772*



**Dry Look.** Sealed gloves and a magnifying eyepiece enable Arlander Favors, a technician at Space Systems Division, to work on a 1" x 1" hybrid microcircuit in a nitrogen-filled chamber. The nitrogen ensures that no moisture will remain inside the hybrid once it is sealed. Space Systems' prototype laboratories develop and test hybrids for space-qualified avionics systems.

# Outstanding Rating Is Received by Convair

Convair has received an "outstanding" rating on a compliance review of its Small and Small Disadvantaged Business Subcontracting program.

The review was conducted late last year by representatives from the U.S. Small Services Management Area of San Diego.

It was the fourth consecutive year the division received

this rating.

W.R. Hobdy, Deputy for Small Business of the Defense Logistics Agency, commended Convair for its overall increase in total dollars and total percentages to small businesses and for developing 60 new minority businesses since the last review.



# Quonset Point Booklet Wins National Media Conference Award

A company-produced booklet about the contributions of Quonset Point employees to their Rhode Island communities was recognized for outstanding achievement in communications during the 9th annual National Media Conference.

The publication, "People of General Dynamics: The Quonset Point Community," received a 1987 Mercury Finalist award during the conference's dinner in New York in December.

Four employees who produced the booklet shared the award: George Salamon, Corporate Manager-Editorial Services; Bruce E. McIntosh, Corporate Graphics Supervisor; Thomas J. Rule, Corporate Graphics Project Administrator; and Robert F. Fraher, Quonset Point Senior Audiovisual Services Coordinator.

Entries for the Mercury Awards competition were received from more than 850 public relations agencies, corporations, associations, government agencies and suppliers in the United States and abroad.



**Lima Tank Plant Earns Award.** Secretary of the Army John O. Marsh Jr. (left) presented a plaque to G. (Dino) Salvador, Land Systems Division Manager of the Army's Lima Tank Plant. The Ohio-based plant finished third among hundreds of facilities competing worldwide in the Department of the Army Energy Conservation Program. Basis of the award was the Lima plant's outstanding Energy Conservation Program.

## Savings and Stock Investment Plans

	Annual Rate of Return for the 12 Month Period Ending:		
	Nov. 1985	Nov. 1986	Nov. 1987
<b>Salaried</b>			
Government Bonds	15.0%	11.8%	5.6%
Diversified Portfolio	33.5%	30.1%	(2.7)%
Fixed Income	12.5%	12.0%	11.5%
<b>Hourly</b>			
Government Bonds	15.0%	11.3%	5.7%
Diversified Portfolio	33.1%	30.7%	(2.2)%
Fixed Income	12.4%	12.1%	11.5%
<b>GD Stock Closing Price</b>	\$68.37	\$74.00	\$43.25
( ) Negative Number			

## GENERAL DYNAMICS

# World

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## Companywide Employee Survey Reports Compiled by Sue L. Shike

# Flexible Benefits Are Approved for 1989; Initial Preparations Are Under Way

In the employee survey and during the feedback sessions at the divisions, General Dynamics employees suggested a wide range of benefits improvements from vision benefits to child care assistance. Many individuals also said they would prefer a flexible benefits program. These recommendations were among the reasons behind the recent decisions to adopt a flexible benefits program.

The new program begins Jan. 1st, 1989, and will cover all salaried employees and some hourly employees. Modifications to the payroll system, establishment of the enrollment system and development of extensive communications will be done during 1988. The enrollment process will occur during the last quarter of this year.

"Flexible benefits offer the company a way to respond to employee concerns within the available resources," said Arch H. Rambeau, Corporate Vice President-Human Resources.

Flexible benefits are sometimes called "cafeteria plans" because employees can pick and choose from a variety of types and levels of benefits. General Dynamics will give each employee a benefits dollar allowance to buy medical, life insurance and other coverage. In effect, flexible benefits enable employees to create individual benefits packages.

Employees will also have the opportunity to enroll in additional optional plans that would allow them to pay for health-related expenses, such as eyeglasses or child care, with money from their salaries before taxes are deducted or from their unused benefits dollar allowances.

For example, many employees in the employee survey recommended that the company help pay for eye care. Under the flex program those who want vision care benefits will be able to put money from their salaries or unused benefits dollar allowances into an account to pay for them. Expenses for eyeglasses, contacts or exams can be paid through this account with money from their own salaries before taxes are deducted.

The flexible benefits program offers a similar solution for dependent care. Employees can save dollars on care for children or dependent parents. "In terms of our employee population, only some of them use child care," Rambeau said. "But the working parents we heard from felt strongly about the child care issue. One of the strengths of our flex program is that it can better respond to individual situations, like those of employees needing child care."

Other benefits such as maternity leave, vacation and sick days were considered for inclusion in the flexible benefits program and deemed not appropriate. The current maternity leave and sick day policies were reviewed and were not changed. The vacation policy is discussed below.

"With the current needs for cost reduction and containment throughout General Dynamics, we simply can't cover everything everyone would like," Rambeau said. "But the new flex program will give the employees the opportunity to select the benefits best suited for them, while saving money on some expenses that are not currently covered by our benefits plans. It's a cost-effective response to the needs of both employees and the company."

## Salaried Vacation Policy Is Unchanged

The company recently conducted a study that compared General Dynamics' vacation policy for salaried employees with those of other defense companies. The results indicated that General Dynamics' policy is slightly below the defense industry average, as indicated below:

Number of Years Service	General Dynamics' Average	Other Defense Firms' Averages
1-9	2 weeks	2.4 weeks
10-19	3 weeks	3.4 weeks
20-29	4 weeks	4.2 weeks
30+	4 weeks	4.5 weeks

After a considerable amount of deliberation, including an examination of alternate schedules and the accompanying costs that could exceed \$10.4 million annually corporatewide, the decision has been made to leave the current vacation policy unchanged. It was

concluded that to improve the vacation schedule during this increasingly competitive period would be disadvantageous to the company's business.

However, during discussions of this issue in survey meetings, employees sometimes expressed more concern about being unable to take their earned vacation because of job and work pressures. When this happens over a long period, the maximum number of vacation hours is reached and salaried employees cease to accrue vacation normally earned each month. During executive review of this matter, the company's policy of allowing employees to use earned vacation time was reinforced. Chairman and Chief Executive Officer Stanley C. Pace said management has the responsibility to plan manpower loads to include vacation time. "Vacation time off benefits the employee and the company, since periodic physical and mental breaks from work allow employees to maintain maximum effectiveness both on the job and off," Pace said.

## Offsite Child Care Centers Supported

During the employee survey feedback sessions, many employees asked that General Dynamics establish onsite child care centers. After considering several options, the company decided to support offsite centers rather than establish onsite facilities.

There are three basic reasons for not establishing company-managed onsite child care centers:

- There appear to be adequate existing child care centers in the communities where General Dynamics facilities are located.
- Additional personnel, cost of facilities and overhead expenses are inconsistent with General Dynamics' drive for competitiveness.
- Possible financial support of community child care centers would be more cost effective when compared with the capital expenditures and human resources required to establish onsite facilities.

General Dynamics will support offsite child care centers in a manner that will address many of the employees' concerns and needs. Each division will be asked to look for various methods of providing assistance to employees and support for offsite child care centers. The divisions will be looking at some of the

following areas for possible assistance:

- A survey of child care centers in the surrounding communities may be conducted or obtained that determines availability, quality and services.
- This information would be kept current and be provided to all employees. Input from employees will be encouraged to assist the divisions in keeping information up to date and accurate.
- The divisions may consider providing financial assistance to existing child care centers or to establishing additional facilities.
- A "loaned" executive program may be considered to provide short-term assistance in the planning of a new community facility or in a major expansion of an existing facility.
- Employees could be encouraged to become involved with the planning and management of community-operated centers through such means as becoming members of the centers' boards of directors. Paid time off for such involvement could be considered.

Additionally, employees will be able to use before-tax dollars to pay for child care expenses when the flexible benefits program described above begins.



## Electronics Division Is Using an Improved System to Operate a Company

Electronics Division has begun a Manufacturing Resource Planning (MRP II) system that will help make the division more competitive in today's demanding marketplace. MRP II is a set of software tools and management philosophies that together provide a better way to run a manufacturing company.

"MRP II is not just a software system for controlling the factory," said Melville R. Barlow, Vice President and Electronics General Manager. "It's a philosophy and a new way of doing business. It's a team effort whose objective is to run the division in the most efficient and productive manner."

In any manufacturing operation, Barlow said, some basic questions need to be answered: What are we going to make? What does it take to make it? What do we have? What do we need to get, and when? When the manufacturing operation is complex, the tools used to answer these questions become more sophisticated. Computers are essential because the massive volume of data and calculations cannot be done manually.

It starts with a master schedule, a bill of materials, an inventory record and the capability to plan material requirements. "Add the capability for capacity planning, shop dispatching, vendor scheduling and status feedback. Collectively, these tools add up to a Manufacturing Resource Planning system — or MRP II," Barlow said.

MRP II becomes the tool that can answer the questions most efficiently by providing the capability to plan what is needed and when, by determining whether the capacity is available to do the job and by making sure that the right material is at the right place at the right time.

Conversion to MRP II began in January 1987 with a live production pilot in the Microelectronics Center. Thereafter, separate portions of Electronics' business were incrementally converted to MRP II until completion in November. In 1986, the year preceding conversion, the project was directed toward software development, defining the processes and procedures for operating the division under MRP II and, most important, education and training.

"We knew that if we were going to be successful with this project, we had to get people to think differently about how they did their jobs and how they impacted each other.



**Using a Better System.** David J. Wessels, DSD-WC Project Manager (far right), demonstrates the MRP system's ability to show the status of all open shop orders for a given part number. Observers are (left to right standing) Daniel O. Ellingson, James J. Coney and Paul M. Cofoni and Melville R. Barlow (seated).

That was through education," said James J. Coney, Director of Information Resource Management, whose function was responsible for MRP II implementation. Every Electronics employee received at least two hours of overview on MRP II philosophies, and 550 specific system users received up to 115 hours of education and training.

Education and training paid off. Shortly after the implementation of the Microelectronics Center pilot project, Paul M. Cofoni, Division Vice President and Data Systems Division-Western Center Director, visited the area. DSD-WC was responsible for the MRP II software development. Cofoni reported to Barlow: "What really impressed me was the employees' understanding of the MRP process and the improvements it will bring to their

jobs. They have an extremely positive, can-do attitude."

Because MRP II provides better planning, scheduling and loading of the factory through more sophisticated software tools, Electronics projects a net savings of \$7.8 million over five years from reductions in direct labor, support labor, unplanned overtime, excess and obsolete material and material costs.

Now that the division is operating under MRP II, is the task complete? "Absolutely not," said Daniel O. Ellingson, MRP II Project Manager. "Maintaining competitive efficiency in a business is like keeping up personal fitness. It's a lifetime effort. We have begun to make some real improvements, and the MRP II system gives us a tool to make many more."

## G. Mack Harris Conquers Two Handicaps to Master Computers By Joe Stout

G. Mack Harris, a deaf employee in Fort Worth's Aircraft Master Dimension group, has become adept at using many types of computer systems in his eight years with General Dynamics.

Harris uses the aerospace industry's latest electronic tools for three-dimensional graphic design to control design inputs relative to next-generation aircraft concepts. Currently, he is supporting the company's efforts in designing prototypes of the Advanced Tactical Fighter (ATF) as part of the ATF team with Lockheed and Boeing.

Congenital deafness and inability to speak have not blocked his success in performing job tasks, dealing with coworkers and otherwise meeting personal career objectives, according to Harris.

He communicates by sign language and by writing.

Most of his coworkers have some signing ability, and fellow employees are always ready to assist him with necessary business communications by telephone.

Harris' duties on the ATF program have required extensive travel between Fort Worth and the Burbank, Calif., facility of Lockheed, the team prime contractor. Travel has posed no special difficulties for him, and he has been able to interact with new associates at Lockheed just as successfully as with long-term colleagues at Fort Worth, he said.

Sam O. Majors, Fort Worth's Chief of Computer-Aided Design/Computer-Aided Manufacturing Engineering, described Harris as "a highly valued employee" who is always willing to accept new assignments. "Mack communicates well, even in the highly technical environment

that surrounds his work," Majors said. "We have total confidence in his abilities, which is why we didn't hesitate for a minute to send him to another company's site as a representative of General Dynamics."

Harris attended the Virginia School for the Deaf in Staunton, Va., holds a bachelor's degree in social philosophy from Gallaudet University in Washington, D.C., and has completed engineering courses at the University of Texas at Arlington. He has learned to use advanced computer tools by reading and watching. "I rely primarily on observation to learn," he said. "If I am not sure of something, I ask."

He said he has effectively compensated for his hearing impairment by increasing his formal education, sharpening his observation skills and reading extensively.

A long-standing personal interest in computers has made his job at General Dynamics especially interesting and enjoyable, Harris said. He has a computer at home and does programming as a hobby. For example, he has donated his services to program mailing lists and other data for nonprofit organizations.

Hearing-impaired persons are well-suited to working with high technology graphics systems because many of them are skilled at the abstract, "different type of thinking" that facilitates computer use, Harris said. This thinking involves the ability to "picture" computer applications in one's mind, he said.

Outside his work for the company, Harris has held various offices in the Fort Worth Association of the Deaf. In the 1970s, he designed a 5,200-square-foot community center for the organization. He has served on the Texas Governor's Joint Advisory Committee on Education Services to the deaf and was an organizer of the Texas Deafnet Association, a computer network for deaf persons.

In 1987, Harris was elected to the southwestern region board of Telecommunications for the Deaf, a national organization that promotes the establishment of closed-caption television programs and other communications services for the hearing-impaired. His term on the board continues through 1991.

Harris' parents were deaf, and his wife, Sara, is congenitally deaf. Mack and Sara Harris have a deaf daughter, Rachel, who attends Gallaudet University.

Harris said he believes there are many jobs that deaf people can do in today's industries if they have adequate educational preparation and are given the opportunity.



Fort Worth Employee G. Mack Harris, Who Is Deaf, Works Computer Drawings of the F-16



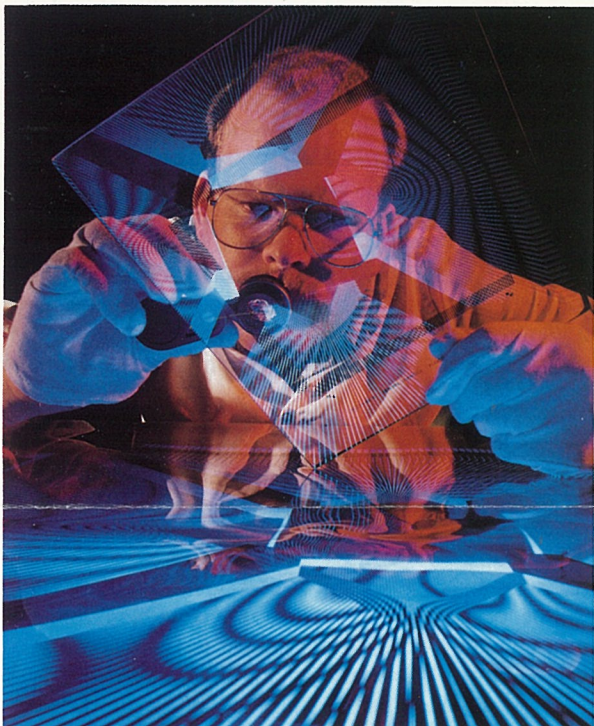
## Consortium Formed To Develop Projectile For NATO Artillery

General Dynamics has formed a multinational industrial consortium to develop an Autonomous Precision Guided Munition (APGM), an all-weather, artillery-fired projectile designed to defeat future armor threats to North Atlantic Treaty Organization (NATO) forces.

The eight-nation consortium, which has submitted a proposal to the U.S. Army for APGM, comprises NATO-member countries and is led by Valley Systems Division.

The consortium's proposal specifies joint development of a single munition that will operate in the European environment.

Key company roles in the program include Valley Systems for system engineering and seeker development; Aselan (Turkey), power supply development; Computing Device Company (Canada), signal processor development; Dornier GMBH (Federal Republic of Germany), signal processor and warhead development; ENSAB/CETME (Spain), warhead performance and integrated logistics support; Matra (France), guidance and control and simulation; Oto Melara (Italy), airframe and gun-hardening tasks; and Signaal (the Netherlands), transceiver design and development.



**Through the Looking Glass.** Tim Hopkins, a technician at Valley Systems Division, uses a magnifier to check the quality of circuit paths printed on a glass plate. A larger version of the circuit paths is on the lighted surface in front of him. The plate, used to test missile electronics, must be accurate to 20 millionths of an inch — less than one-hundredth the width of a human hair.

## Camden Operations Completes Successful Sparrow Inspection

Pomona's Camden Operations and Navy engineers recently completed the most successful Sparrow Missile teardown inspection, according to Edward S. McDonald, Program Manager.

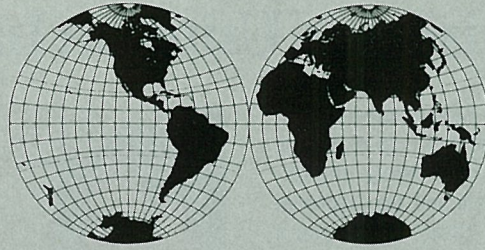
The missile, selected at random, had no major nonconformities and the fewest moderate discrepancies of any previous Sparrow.

According to McDonald, a missile teardown is the process of selecting a completed round and dismantling it to its unit level. The components are then checked electronically and visually.

"We have never had a teardown where there were no major discrepancies," McDonald said.

"One government representative, who had been involved in teardowns for Phoenix and HARM missiles, acknowledged that this missile was the cleanest of any he had seen," McDonald said.

In a report outlining the teardown, the inspection and risk assessments were assigned according to the Navy Equipment Teardown Audit Guide. Along with the zero high-risk nonconformities, the team found no torque verification discrepancies. "This is what we strive for," McDonald said, "and we have achieved it. Of course we can't sit on our laurels."



## Around the World

**CHQ:** William B. Pedace transferred from Electric Boat and was appointed to Corporate Director-Community Relations... Edwin A. Coy joined as Corporate Director-Strategic Defense Initiatives... Carol A. Balerna as Senior Subcontract Auditor... James F. Tarallo as Subcontract Auditor... Carey J. Riley was appointed to Corporate Director-Cruise Missile & Strategic Missile Systems... Linda L. Peter was promoted to Corporate Business Research Representative.

**Fort Worth:** Enrique L. Gomez was appointed to F-16 Program Director... Clyde H. Jordan to International Customer Requirements Director... Ricky D. Allmon, Lilly J. Cross and Larry R. Vantrease were promoted to Inspection Supervisor... Larry T. Beck to Quality Assurance Chief... Van C. Blake to Manufacturing Technology Chief... Earle O. Brown III to Assistant General Counsel... Julie L. Brumback to Senior Engineering Administrative Assistant... Wilson C. Carlyle, Billy A. Elliott and Larry D. Jackson to General Foreman... Philip Chovanec to Manufacturing Technology Supervisor... Donald M. Cline, Wes Culwell, Nan E. Macleod, Donna L. McClain and Thomas E. Stanford to Engineering Administrative Supervisor... Maurice J. Comeau to Quality Assurance Engineering Specialist... David R. Crowley and Richard Marshall to Production Specialist... George A. Cude, Robert H. Dean, Robert E. Miller, Bradley M. Rudd and Fred C. Shipley to Project Engineer... Michael P. Daley to Logistics Group Supervisor... Ronald N. Drumm to Logistics Support Administration Chief... Joseph D. Fowler and William S. Warren to Finance Chief... Thomas A. Ghesquiere and Richard W. Jones to Engineering Administrative Specialist... Amiel J. Guitz, Aubrey L. Richardson and Dogan Ulkekul to Senior Field Engineer... Raymond L. Harris and William E. Steelman to Superintendent... Robert J. Haskell to Offset Manager... Ralph E. Hassel, Gene L. Magee and Katherine V. Parris to Engineering Project Manager... Kent A. Kelso to F-16 Administration and Finance Manager... Yong-ho Kim to Korea Business Manager... Joan M. Kriston and Mark R. Miller to Material Planning Supervisor... William J. Kwon to Field Engineer... Frederick E. Lewis to F-16 Program Manager... Cleo M. Liles to Engineering Administrative Group Supervisor... David T. Lloyd to Project Manager... A.C. Long and Stephen R. Wagner to Production Control Manager... Laurie S. McCollum to Assistant Project Engineer... Barbara J. Medley to Industrial Security Supervisor... Kenneth S. Murray and William D. Pass to Financial Supervisor... Allan B. Phillips to Manufacturing Engineering Chief... Dale M. Prior to Production Management Specialist... Rocky N. Runnels and Tim A. Secor to Inspection General Supervisor... Ozie F. Savage Jr. to Field Operations Supervisor... Glenda M. Spivey to Project Coordinator... Kenneth G. Timpson to Senior Project Engineer... Andrew J. Worlow to Program Specialist.

**Convair:** Edward R. Abate was appointed to Finance Director... James G. Macoubray III to Plant Services Director... Richard K. Ball and Walter R. Chapman were promoted to Group Engineer... Patrick B. Cornelius, Paul A. Hedtke, Robert M. Kane, Michael Patrick, Robert Perisho Jr. and Hubert C. Watton to Engineering Specialist... Carlos I. Diz to NC Engineering Specialist... William H. Dunaway to Manufacturing Engineering Specialist... Luis B. Miranda to Quality Control Chief... Kathleen T. Williams to Financial Supervisor.

**Space Systems:** Barbara J. Freeman was promoted to Marketing Manager... Frederick D. Kuenzel and Richard A. Jones to Program Manager... Steven K. Saiget to Technology Transfer Offset Manager... Monte B. Adams, Frank P. Coria, Philip E. Parker and Richard J. Velazquez to Senior Project Engineer... Eddie M. Leung, Luis Ojeda Jr. and Glen E. Wadleigh to Senior Engineering Specialist... Robert M. Mitchell to Configuration Management Senior Specialist... Clay D. Westling to Senior Program Administrator... Gerald G. Buckner and William T. Fandel to Integrated Logistic Support Engineering Specialist... Edward D. Kelly to Plant Engineering Specialist... Patricia J. Crooks to Finance Chief... Douglas D. Burleigh, Karlson C. Chan, William P. Glunt, Steven J. Greene, Michael J. Gruszczynski, Robert W. Inscore, Andrew Kytasty, Theodore C. Moore, James L. Morris, James M. Nelson, John R. Nordstrom, Arthur M. Prast, Stephen B. Seus, Thomas J. Tyczkowski, Michael J. Vaccaro, Verl C. Walker, Robert J. Ward and John I. Washburn to Engineering Specialist... Jeffrey T. Hartnett to Senior Marketing Representative.

**Pomona:** James C. Barry, Morgan W. Lewis and Grace A. Rivas were promoted to Manufacturing Supervisor... Glenn R. Duffin and Diane J. Misiak to Superintendent... Max J. Ledesma to Accounting Chief... Frank D. Richardson to Group Engineer... Carol A. Schultz to Departmental Assistant... Robert A. Hulsey to Senior Test Engineer... Craig E. Kaparoff to Publications Group Supervisor... Phillip B. Keith to Assistant Project Engineer... William D. Kennedy to Plant Engineering Supervisor... Kurt M. Kutyla to Contracts Chief... Richard F. Leonard to Cost Control Specialist... Ronald N. Nordstrom to Plant Engineering Chief.

**Valley Systems:** Loyd L. Torrey was appointed to Manufacturing and Production Engineering Director... Anthony P. Minadeo was promoted to Group Engineer... Alicia A. Gary to Equal Employment Opportunity Manager... Phyllis E. Eberhardt to Project Administrator... Caroline A. Jarvis to Product Line Manager... David E. Wilson to Assistant Project Engineer.

**Land Systems:** Cathy L. Stock was promoted to Financial Systems Specialist... David R. Gabriels to Senior Financial Analyst... James E. Watson to Human Resources Chief... Ronald F. Boberg to Industrial Engineering Supervisor... Paul J. Kosik to Procurement Planning Supervisor.

**Electric Boat:** Charles F. Knapp was promoted to Superintendent... Thomas J. Fergie to Assistant Superintendent... John R. Kirkland to Environmental Resources Manager... John E. O'Connor to Proposal Development Manager... William J. Bresnan to Material Progressing and Control Chief... William W. Lee to Systems and Procedures Chief... Brian D. Turley to Assistant Program Management Chief... Robert F. Larock and Robert E. Peruzzotti to Senior Material Progressing and Control Supervisor... Wilburn D. Stone to Material Progressing and Control Supervisor... Thomas H. Lane to Engineering Supervisor... Richard Commander to Engineering Services Supervisor... Donna R. Marcinek to Quality Systems Supervisor... William D. Shaffer to Chief Nuclear Test Engineer... James F. Giddings to Assistant Chief Nuclear Test Engineer... William P. Heuer to Chief Test Engineer... James W. Lancaster to Assistant Chief Test Engineer... Alan D. Blay to Test Operating Engineer... Peter A. Bellavance, Edmund L. Czapek and Henry A. Doucette to General Foreman... Jeffrey G. Hoover to Foreman... Lori K. Barry to RADCON Foreman... David A. Whitehead to Human Resources Planning Administrator... George D. Duryea to Group Trade Planner... At UK/TRIDENT Site, William L. Katkaveck to Manager... At Quonset Point, Joseph J. Holland to Engineering Specialist... Patrick W. Johnson to Foreman I... Dennis L. Mayo to Senior Packaging Administrator... At Avenel, Richard C. Bermudez to Business Systems Administrator... At Kesselring, Amelio A. Iannitelli and Lex W. Wiltrout to Assistant Superintendent... James B. Heminway to Engineering Supervisor... At Kings Bay, John P. Garzone to Project Control Supervisor... James T. Hudson to Data Management Supervisor... Keith M. Noseworthy to Foreman.

**Cessna:** R.E. Edwards was promoted to Project Engineer.

**GDSC:** Milton F. Snyder was appointed to Egyptian Tank Plant Operations Director-Cairo... Austin M. Morgan was promoted to Material Manager... Donald R. Burrier to Workshop Branch Leader... Sixto Arredondo to Engineering Group Supervisor... Marlene R. Miller to Associate Accounting Analyst... Harold D. Cox transferred from Convair and was promoted to Engineering Specialist.

**Data Systems:** At Western Center, John K. Clevenger was promoted to Chief Project Engineer... Sheila H. Fortner and Peggy S. Young to Programmer Analyst... Bartley W. Christian to Computer Systems Specialist... At Eastern Center, Kenneth R. Braun to Operations Services Supervisor... William H. Towns to Customer Services-Facility Manager... Ralph J. Wells to Engineering Software Chief.





Photographed at Home of Franklin D. Roosevelt  
National Historic Site, Hyde Park, N.Y.

## HIS LEGS WERE CRIPPLED. BUT HE CARRIED THE WEIGHT OF THE FREE WORLD ON HIS SHOULDERS.

He was used to carrying a heavier load than most. The braces on his legs weighed fourteen pounds.

But he not only campaigned for and won the Presidency despite his handicap, he won it four times. From his wheelchair, he steered the country through two of the most important events of the twentieth century — the Great Depression and World War II.

Yet in a survey of high school seniors, 52% could not identify Franklin Delano Roosevelt.

Many could not identify Churchill or Eisenhower, either.

That's shocking and sad, and we wanted to do something about it.

So General Dynamics has brought a series of dramatic profiles of twentieth century leaders to PBS.

And in a mailing to America's high schools, we have offered free videocassettes of our PBS programs featuring Churchill, Eisenhower, LBJ, and Pope John XXIII.

Twenty-two million American students will see them and learn how individuals with courage and conviction can make a difference.

**GENERAL DYNAMICS**  
*A Strong Company For A Strong Country*



## Aggressive Program Is Aimed at Eliminating Hazardous Waste By Dave Lange

In late 1984, General Dynamics embarked on a very ambitious program called Environmental Resources Management (ERM). The program aimed to ensure that the company operated its business in proper balance with the environment, a goal that involves more than compliance with environmental laws and regulations.

For General Dynamics, this meant assuming a leading role in making industry exist harmoniously with the environment.

Vice Chairman Oliver C. Boileau, then President of General Dynamics, chartered the ERM program in November 1984 with a bold statement: "We must take action to eliminate the generation, discharge and disposal of hazardous materials and to more efficiently utilize our material resources." He set Dec. 31, 1988, as the deadline to eliminate hazardous waste.

"Note that Mr. Boileau did not say to just reduce hazardous waste by a certain amount," pointed out Frank Basile Jr., Corporate Director-Environmental Resources Management. "He said to eliminate it."

The company established long-range objectives toward a goal of zero discharge of hazardous waste. ERM studies have resulted in a plan that will make it possible to reduce the company's annual output of hazardous waste by nearly 65 percent from the end of 1984 through 1988, and that reduction should continue to improve to 94 percent by 1990, Basile said. "During that period from the end of 1988 through 1990 we'll be actively working to establish incinerator capability at Electric Boat, Fort Worth and for the West Coast divisions to achieve further progress," Basile said. "These projects started at the end of 1984 and require more time for completion."

The program's success lies in the accomplishments made by each division. Plans were developed and are implemented under the leadership of each division's general manager. In many cases, the divisions' performances toward the objectives are better than planned.

Another aspect of the ERM program emphasizes staying abreast of new government environmental legislation. The Corporate ERM Department and division ERM program managers have been briefed by officials of the U.S. Environmental Protection Agency on recent legislation. "There are so many overlapping regulations," Basile said. "That's why ERM people have to constantly keep in touch with new developments."

"People are not completely aware of the hazardous waste issues the company faces. The government says you



**Anti-PCB Campaign.** An electrical unit containing PCBs is removed at Pomona, which is one of several divisions to have reached one of the goals of the Environmental Resources Management Program: removal of all company-owned electrical units containing PCBs.

are forever responsible to clean up any environmental release of your hazardous waste. What may have been acceptable in disposing of hazardous waste 20 years ago, and even as recently as 10 years ago, may no longer be acceptable under today's standards, and yet, we have to comply with the current standards. Therefore, dealing with hazardous waste is a cradle-to-grave responsibility.

"Once you generate a hazardous waste, you own it forever. That means that you are responsible for its ultimate fate and any adverse impact it may have upon the environment. That's why we have the zero discharge objective — to fulfill our responsibility for dealing with hazardous waste properly so that there are no future problems."

ERM's aggressive approach is scoring many successes:

- The company has reduced its output of manifested hazardous waste that is treated or disposed by outside contractors by 51 percent from 1984 through 1987.

- The number of company-owned electrical devices containing polychlorinated biphenyls (PCBs) has been cut by 61 percent over the last three years. Basile expects the number of General Dynamics-owned pieces of PCB equipment to be reduced to near zero by the end of this year. To date, Convair, Electronics, Pomona, Space Systems and Valley Systems divisions have achieved the objective of zero PCB equipment.

- Where feasible, all underground single-walled storage tanks are being replaced with double-walled tanks to eliminate the possibility of having undetected leaking tanks. The double-walled tanks have leak detection monitors in the space between the two walls. Monitoring devices to check for leaks are being installed on remaining single-walled tanks.

- Plans are under way to construct incinerators at Electric Boat and Fort Worth and on the West Coast to dispose of residual hazardous waste that will remain after all plans for source reduction and recycling are in place.

These accomplishments reflect the importance attached to ERM by company management. "The most significant thing about the program is that we've got top management support at the Corporate Office and at the divisions," Basile said. The measures that have been taken to solve that problem have attracted industrywide attention. Other companies have begun ERM programs modeled after the one at General Dynamics.

After over three years of operation, ERM is becoming everything the company had expected. "We are recognized as leaders for our accomplishments," Basile said. "We have an excellent program going, and we intend to keep working on it aggressively."

True to its role as a leader in ERM, General Dynamics organized the first industrywide ERM aerospace symposium. The meeting, which was sponsored by Fort Worth, attracted 40 representatives of various aerospace firms and the U.S. Air Force.

"When we meet with people from other companies, they ask how we've done it," Basile said. "People outside General Dynamics recognize that we have an aggressive and exciting program. We are making progress, and we continue to pursue our objectives in areas where improvement is possible. The major ingredients for our success have been top management's dedicated commitment and directions for the program."

## Fort Worth Conducts Coproduction Training for Many Nations By Joe Stout

Fort Worth's Tina R. McCormick and Rhonda J. Reifschneider have daily person-to-person contact with individuals from many foreign nations in their jobs as customer service representatives in the coproduction group of the division's Training Department.

Their section performs coproduction training for nations that manufacture F-16 parts under aircraft purchase agreements. Many nations are offsetting the cost of procuring the aircraft by having their own industries manufacture such F-16 parts as wings, engine access doors and fuselage components. In addition, F-16 assembly lines have been established for codelivery of the aircraft in Belgium, the Netherlands and Turkey.

The coproduction group was formed to coordinate the extensive personnel training that is required to make the programs successful. About 25 of the Training Department's 58 employees are assigned to coproduction training.

The Training Department is part of Human Resources, and its other sections perform skills training and computer-based training for Fort Worth employees.

In addition to handling training-related tasks such as scheduling, McCormick and Reifschneider help coordinate the many types of support and assistance that must be provided to foreign students to make their assignments in the United States comfortable and productive.

"Many of the students come to the United States with preconceptions of what this country is like," McCormick said. "Sometimes their ideas come from television shows, like the series 'Dallas.' Needless to say, their impressions change a lot before they return to their home countries."

"The new students generally experience intense cultural shock, especially if they haven't been to America before," Reifschneider said. "After a long day of training, they still

have to deal with many new things that we just take for granted. Opening a checking account, for example, can be a trying experience for someone not familiar with our banking system and our currency."

The students rely on the support of their General Dynamics hosts for help in a variety of circumstances. The coproduction group has representatives available to answer questions and assist with housing, medical needs, transportation and escort requirements while the students are in the company facility.

The training task involves more division departments than just Human Resources. Much of the training consists of on-the-job observation, where students are assigned to learn first-hand with employees at work in the factory or on the company flight line.

"People from many of the participating division departments have attended cross-cultural training to better familiarize themselves with the customs of the different countries," McCormick said.

The nations that have signed coproduction agreements to date include Belgium, the Netherlands, Norway, Denmark, Israel, South Korea, Turkey, Greece, Singapore and Indonesia. The Turkish coproduction training program has been the largest and will involve more than 300 Turkish workers trained in the United States by 1989.

Reifschneider received Turkish language instruction to prepare her for duties on that program. She said the training has been invaluable, especially because it allows her to pronounce students' names correctly. "Otherwise, some of the students might never hear their names right the whole time they are in the United States," she joked.

Coproduction training is conducted in English. Students are required to have a certain English language proficiency as a prerequisite to training. The students' assignments in this country range from two weeks to more than 18 months.

McCormick and Reifschneider say they enjoy their work and find it interesting. Before joining General Dynamics, neither trained specifically for dealing with foreign nationals. McCormick holds a business degree and Reifschneider a degree in a human resources field.



**F-16 Coproduction Training.** Training Customer Service Representatives Rhonda Reifschneider (left) and Tina McCormick review course schedules beside plaques representing the nations that have purchased the F-16. Several of the countries are participating in coproduction.



## Fort Worth Model Contest Challenges Students in Engineering Projects

Fort Worth joined the Texas Alliance for Minorities in Engineering recently in sponsoring a contest that challenged middle and high school students to build engineering models with themes related to the bicentennial of the U.S. Constitution.

The contest was held in conjunction with the Texas Alliance's annual Math and Science Teachers Symposium, which Fort Worth and the (Dallas-Fort Worth) Metroplex Alliance for Engineering Education conducted at the division's Human Resources Training Center. A number of division employees prepared materials for the symposium and led workshop sessions.

The seminar allowed math and science teachers to become more aware of how their subjects are applied in industry, which will help them make courses more interesting and practical, said Steve DeLeon, the Fort Worth Engineering Personnel employee who has coordinated the company's involvement in the program for the last four years.

The symposium consisted of several workshop sessions and a panel discussion of women in engineering careers.

Fort Worth engineers Sherilyn S. Severin and Ana M. Garcia were among the panelists.

Employees Wesley T. Beard and Olin E. Weiss led a session titled Math and Science in Aircraft Development, which provided the teachers with examples to take back to the classroom. The attendees received copies of a brochure relating concepts used in the design and manufacture of aircraft to similar concepts being taught in math and science textbooks.

The brochure was prepared by Beard and Fort Worth employee James M. Phillips, with assistance from co-workers. It references the examples to specific page numbers in textbooks and was updated this year to correspond with new books being used in Texas schools.

The brochure has attracted inquiries from other companies that would like to prepare similar materials, DeLeon said.

The overall winning entry in the engineering contest was submitted by a group of students at Nolan High School in Fort Worth. It was a scale model of the Patowmack Canal, a waterway commissioned under the guid-

ance of George Washington. A report prepared by the students explained that interstate meetings held to discuss and plan the canal predated, and in some ways inspired, the formation of the Constitutional Congress.

Washington recognized a need for the canal but foresaw potential political problems in its development, since it bordered Maryland and Virginia. The canal was built in the late 1700s and was used from 1802 until 1828.

Four students spent a combined total of about 180 hours on the model-making project outside of regular class time, DeLeon said. Part of the task was to keep an engineering log documenting all their research and progress, he said.

Contest entries were judged by representatives of the U.S. Army Corps of Engineers and architectural and engineering firms in the Fort Worth area.

Jim D. Engelland, Fort Worth's Director of Avionic Systems, presented contest awards as the symposium's luncheon speaker.

## Land Systems Given U.S. Army Certificate By 'Top Gun' Unit

The "top gun" in the 1987 Canadian Army Trophy (CAT) competition recently presented a certificate of achievement to Land Systems for its support to the winning U.S. Army entry.

The 4th Battalion took first place in a competition with entries from five other NATO armor units in the biennial CAT shoot. Tank units from Canada, Great Britain, Belgium, the Netherlands, West Germany and the United States participated in the live fire exercise.

Lt. Col. Phares E. Noyes, Commander of the 4th Battalion, 8th Cavalry of the U.S. Army Europe, 3rd Armored Division, presented the certificate to William Barnes, Chief of the Land Systems Europe Field Team, who accepted it on behalf of Land Systems and the Abrams support team.

"I extend the heartfelt appreciation of all of our soldiers for the support you rendered," Colonel Noyes said. "In 24 years of Canadian Army Trophy competition, the United States Army had yet to win. In providing the best possible technical assistance for the best available tank, the M1 Abrams and Land Systems Europe Field Operations significantly contributed to the end results. I thank you for this support."

In a message to A.W. (Bill) Carion, Land Systems Division Vice President and M1 Program Director, Barnes asked that all Land Systems employees be made aware of the recognition. "Without the continuing exceptional support from all of Land Systems Division, the Europe Field Office could not be totally responsive to the U.S. Army needs for the Abrams systems," Barnes said.

The certificate is displayed in the Land Systems office in Vilseck, West Germany.

## 'Block 0' Production Of Phalanx System Ends at Pomona Plant

An end of an era passed quietly at the Pomona plant when the last Phalanx Gun System "Block 0" production model was delivered to the Navy. Production has already begun on the follow-on "Block 1" version.

Block numbers are used to identify the weapon system's particular production design and configuration. The final Block 0 system was the 535th unit delivered by Pomona since Phalanx production began eight years ago.

Pomona designed the Block 1 to incorporate technological improvements and upgrade the system. Current contracts call for 123 Block 1 systems to be delivered over the next 21 months.

The Phalanx Close-in Weapon System is the U.S. Navy's last line of defense against airborne threats to the fleet. It has been manufactured exclusively by Pomona for U.S. and allied navy ships.

It is a total defensive weapons system capable of operating in an all-weather environment. The Phalanx system automatically carries out search detection, target threat evaluation, tracking and firing. It uses an electrically controlled, hydraulically driven 20mm six-barrel Gatling-type gun capable of firing more than 3,000 rounds per minute.



Consolidated's First Commercial Sports Plane/Trainer, the Model 14 Husky Jr.

### ***GD Flashback***

## Husky Jr. Outsold All Rivals in 1929 By Edward D. Williams

Maj. Reuben H. Fleet was a stubborn man, which is why the Consolidated Model 14 Husky Jr. was a successful airplane, followed by a whole series of highly popular airplanes derived directly from it.

Fleet, founder and President of the Consolidated Aircraft Corporation of Buffalo, N.Y., helped design the Husky Jr. in 1928. However, when sales lagged, the Consolidated Board of Directors wanted no part of it. So Reuben Fleet bought the rights to the plane, renamed it the Fleet Husky Jr. and continued producing it. The next year, when the plane was outselling all its rivals, Fleet sold the rights back to Consolidated.

The Husky Jr. grew into a complete line of fabulous Fleets, Model 1 through Model 11, through the early 1930s. Despite the initial lack of faith by the Consolidated directors, eventually about 1,000 Husky Jrs. and other Fleets were sold.

The Model 14 Husky Jr. was the right plane at the right time because Reuben Fleet was ready for the boom in private flying that developed in the late 1920s. In 1928, Fleet decided to enter this promising field by developing a commercial sports plane from the highly successful Consolidated PT/NY trainers produced for the Army (PT) and the Navy (NY).

Moving with speed and secrecy, Fleet rented a suite of rooms in the Buffalo Athletic Club and locked himself up with four other Consolidated officials. In two and a half days, they finished the design of the Model 14, a smaller cousin of the military trainers.

The Husky Jr. was a sprightly airplane, rugged in appearance, with frills held to a minimum; simplicity and efficiency were stressed. It was a two-place open cockpit biplane, holding the pilot and a passenger in tandem in a strange-looking elongated cockpit with no windscreen between them. It had a wingspan of 28 feet, was 20 feet, 9 inches long and had a gross weight of 1,450 pounds. The biplane was powered by a seven-cylinder Warner "Scarab" engine generating 110 horsepower. Its top speed was 105 miles an hour, it cruised at 90 and landed at a docile 40 miles an hour. It had a ceiling of 13,500 feet and a range of 350 miles. The Husky Jr. was light and quick on the controls, making it an exceptionally aerobatic airplane. It also featured the extremely strong construction that made it and later Fleets practically "unbreakable" airplanes.

The approved type certificate for the Consolidated Model 14 Husky Jr. — ATC #84 — was issued in November 1928. The first three planes, which had been built in 26 days, were flown to a Chicago aeronautical fair, where two of them were sold for \$7,500 each. But succeeding sales were slow, and the program was \$174,000 in the hole by the end of the year. The Board of Directors decided to end production of the plane, and Fleet took it over and set up his own personal subsidiary, Fleet Aircraft, Inc. By the summer of 1929, sales were booming, and Fleet turned the plane back to Consolidated.

Future versions of the Husky Jr. retained the Fleet name, and Fleet Aircraft, Inc., was kept intact as a sales agency and Consolidated subsidiary. Its head was Lawrence D. Bell, a Consolidated vice president who founded Bell Aircraft, Inc., in 1935.

The Husky Jr., with some minor modifications, evolved into the Fleet Model 1, with approved type certificate #122 issued in May 1929, and a companion Fleet, Model 2 — with a Kinner K5 engine — which received ATC #131 in June 1929. Later Model 1s and the Model 2 had two individual open cockpits instead of the one elongated single cockpit of the Husky Jr.

More than 300 Fleets were delivered in 1929, and several hundred were sold at home and abroad in the early 1930s despite the depression. At the National Air Races held in Cleveland, Ohio, in August 1929, Mrs. Keith Miller flew a Fleet Model 2 to victory in the 50-mile event for women (the runners-up included Lady Mary Heath, Phoebe Omile and Amelia Earhart). A survey in the spring of 1930 showed Fleets in use at many of the country's approved flying schools.

In March 1930, a new manufacturing subsidiary, Fleet Aircraft of Canada, Ltd., was set up as a Consolidated division in neighboring Ontario. It assembled two Fleets a day from a combination of American and Canadian-made parts in a small new factory at Fort Erie. One of its early customers was the Royal Canadian Air Force, which ordered 20 trainers. The subsidiary was sold to Canadian interests in December 1936, after Consolidated had moved to San Diego, Calif., and thereafter operated under the amended name of Fleet Aircraft, Ltd., while Consolidated went on to become a giant in American aviation.





**Before and After.** Remaining structure of F-111D No. 90 is delivered to the Fort Worth factory in summer 1984 and F-111D No. 90 departs Fort Worth following its restoration to fully operational condition. Upon its arrival at Cannon AFB, maintenance officers sent this message to Fort Worth: "Another EXCELLENT product produced by your company."

## Fort Worth Restores a 'Basket Case' F-111D to Flyable Condition By Joe Stout

In May 1976, the U.S. Air Force lost an aircraft from its highly valued but finite F-111 fleet because of an engine failure and fire that occurred with the airplane on the ground at Cannon AFB, N.M.

Late in 1987, more than 11 years later, the Air Force regained the aircraft in fully operational condition after completion of its restoration at Fort Worth. F-111D No. 90 is the 11th airplane that has been returned to service through Fort Worth's F-111 Restoration Program.

It is also the most extensive restoration that has been performed by engineers and assemblers assigned to the F-111 Restoration and Modification Center, which is located in the main factory building just north of the F-16 assembly line. The restoration of F-111D No. 90 required 39 months, compared to an average of 21 months for the 10 F-111s that preceded it.

"The severity of the aircraft's condition presented a formidable task," said Jimmie A. Carlisle, Manager of F-111 Restoration. "More than 12,600 repair parts were used, and we virtually rebuilt the entire rear section. When the engine failed, one of the jet's fan blades ruptured a fuel tank, causing a major fire."

In addition to fire damage, the airplane had been extensively cannibalized for spare parts during several years it spent in the Air Force's aircraft graveyard at Davis-Monthan AFB, Ariz. "There was virtually nothing left in the cockpit," said Fort Worth's Joseph B. Brown, who directed the restoration.

"One of the major jobs was installing all the avionics back in the airplane, because the F-111D's avionics system

was far ahead of its time when it was introduced in the 1960s. The system is very complex, even by current standards," Brown said.

When the aircraft was transported to Fort Worth in 1984, an untrained observer would have picked it as a poor candidate for restoration and return to flying status. But the main structure, "the heart of the airplane," was there, Carlisle said. "Underneath the weathered paint and dusty panels lay the essentials to make the project feasible," he said.

Of the parts used in the restoration, 3,000 were fabricated at Fort Worth, 8,000 were obtained from Air Force spares supplies and 1,600 were purchased from other sources.

In addition to all the repair work, F-111D No. 90 had 229 Time Compliance Technical Orders, consisting of repairs, changes and maintenance actions applicable to the entire fleet of F-111Ds, to catch up on, Carlisle said. All of these were made current before the airplane was accepted by the Air Force and flown back to Cannon AFB.

Maj. Sam Via, an F-111 pilot from McClellan AFB, Calif., flew the final acceptance flights in the airplane and delivered it to Cannon AFB. "The airplane has more new parts and new panels than any F-111 I've ever seen before," said Major Via, who has more than 1,500 flight hours in the type. "It's almost a brand new airplane."

Since Fort Worth has no test pilots who are F-111-qualified, Major Via and other Air Force pilots have made all of the test and acceptance flights in the restored airplanes. Major Via admitted that he "takes things a little

slower" when making the first flight in a rebuilt aircraft that has been on the ground for several years.

However, Major Via said the restored F-111s usually handle like new airplanes. "It never ceases to amaze me how few problems we have with the restoration airplanes," he said.

Due to its years out of service, F-111D No. 90 is the lowest flight-time aircraft in the inventory of Cannon AFB's 27th Tactical Fighter Wing. One F-111 restored earlier at Fort Worth has been designated the representative wing aircraft that is flown to other locations around the country for public display, and another has represented the unit in Air Force bombing competitions, according to Brown.

Two additional aircraft, F-111D No. 11 and F-111E No. 60, are presently being restored at Fort Worth.

Fort Worth delivered a total of 562 F-111s in the 1960s and early 1970s. The aircraft is still unique in its ability to perform certain critically important Air Force missions, and it has a projected service life that extends past the year 2010. It is estimated that production of an F-111-type aircraft today would cost more than \$40 million per unit. The average cost of the restored airplanes is a fraction of that figure.

For these reasons, F-111 restoration has been an excellent investment for the Air Force, said Harry T. Stucker, Fort Worth's F-111 Deputy Program Director.

"There's nothing that can replace the F-111," Major Via said. "I think the restoration program is terrific. It's the only way we can add to our F-111 inventory."

## Convair's Tomahawk Missile Program Ends 1987 on an Upswing By Julie C. Andrews

Announcement of the Fiscal Year 1988 cruise missile award and several year-end milestone test flights have capped a successful year for Convair's Tomahawk program.

Convair has been selected to manufacture the maximum 70 percent of the Fiscal Year 1988 Tomahawk cruise missile procurement, it was announced by the Cruise Missile Project (CMP). Under the \$285 million contract, Convair will manufacture 332 of the 1988 buy of 475 sea-launched cruise missiles.

"This win is strategic to our operations in San Diego," said Michael C. Keel, former Cruise Missile Program Director and recently named Corporate Vice President and Valley Systems General Manager. "Convair employees met the competitive challenge required to achieve this award, demonstrating that we remain a strong leader in the production of this vitally important weapon."

The competition for the right to manufacture the largest percentage of Tomahawk all-up-rounds (AURs) has been between General Dynamics and McDonnell Douglas since 1985. Convair won 60 percent of the business in 1985 and 1986. Convair overcame last year's 40 percent award with this year's 70 percent win. Since total program competition began on all elements of the Tomahawk weapon system, more than \$1.8 billion in savings has been realized, according to the CMP.

In another year-end achievement, a Convair-built U.S. Navy Tomahawk sea-launched cruise missile (SLCM) destroyed multiple targets by accurately dispensing live submunitions in a 500-mile flight off the coast of Southern California. The missile was launched from a submerged submarine and made several passes over San Clemente Island. On the island, it destroyed an aircraft and missile site, then came back and destroyed a radar site. Once the munitions were depleted, the empty missile dove into a fourth target.



**One of Four Targets Attacked by a Submunitions-Dispensing Tomahawk in a Late 1987 Test**

Three more successful test flights followed in December, including another submunitions dispensing flight within the Pacific Missile Test Center. The missile flew inland to the China Lake test range and attacked three targets on three passes before concluding with a terminal dive into a separate target area.

Tomahawk vertical launch advanced toward next year's planned initial operational capability. The last test flight of 1987 marked the first vertical launch of Tomahawk

from a Navy combatant. As part of the test, the Tomahawk countdown was interrupted twice to launch Standard Missile Launch Test Vehicles. This was the first time combined live firings of Tomahawk and Standard Missile had been attempted. In a critical test earlier in the year, an Aegis cruiser carrying vertical launch Tomahawk, Standard Missile and antisubmarine rockets successfully withstood the near-miss shock loads induced by depth charges detonated near the ship.



## Equal Employment Opportunity Message from Chairman Pace

Dear Employees:

Equal employment opportunity continues to be an important and integral part of the General Dynamics management philosophy and policy. We recruit, hire, train and promote persons in all job classifications without regard to race, color, religion, sex, age or national origin.

It is our job to ensure that all of our personnel actions are executed and administered to further the principle of equal opportunity, including meeting our obligations with respect to the handicapped and veterans.

As with all other administrative functions, our goal is to achieve zero defects in the administration of this government contract obligation.

Although we have made significant progress in increasing the representation of minorities and women at all levels throughout the company, we must continue affirma-

tive action at every General Dynamics operation and facility and ensure that equal opportunity exists in fact, as well as in policy. We have work to do, and I am committed to doing it. I expect all members of our management team to have the same commitment.

All members of management must be fully aware of and trained as to their responsibilities in carrying out our equal opportunity and affirmative action commitments and in maintaining a work environment free of hostility or harassment.



## David J. Wheaton Has Been Promoted To Corporate VP

David J. Wheaton has been appointed Corporate Vice President-Program Development and Planning at the Corporate Office.

Wheaton, who previously was Division Vice President-Marketing at Fort Worth, assumed his new post Feb. 15th.



Wheaton

In his new assignment, he is responsible for implementing corporate planning, assisting divisions and corporate officers in establishing programs for development and maintaining a professional and organized approach to the marketing function at the divisions.

Wheaton, 47, joined General Dynamics as a design engineer at Convair in

1967 and progressed into positions in the marketing area. He transferred to Fort Worth in 1975, rising to Director of F-16 Marketing. He was named Vice President-Marketing in 1980, with responsibility for all marketing functions of the division, including product planning and product marketing, government support and customer relations.

A native of Las Vegas, N.M., Wheaton was graduated from the University of Colorado in 1962 with a Bachelor of Science degree in Aeronautical Engineering. He also served in the U.S. Navy as a pilot on active duty and in the reserve.

## Company Announces Record Earnings, Sales for Past Year

General Dynamics announced record earnings and sales for 1987 on Jan. 27th. Net earnings for the full year were \$437.3 million on sales of \$9.3 billion.

In the previous year, the company reported a loss of \$52.5 million on sales of \$8.9 billion. Results in 1986 included a charge to earnings of \$420 million to reflect the writeoff of the excess purchase price of Cessna Aircraft Company.

Earnings per share for the twelve-month period were \$10.26, compared to a loss of \$1.23 per share in 1986.

Earnings in the fourth quarter of 1987 were \$95.3 million, or \$2.27 per share, on sales of \$2.4 billion. Comparable amounts in the previous year were a loss of \$326.1 million, \$7.64 per share, on sales of \$2.4 billion, including the \$9.84 per share writeoff at Cessna.

As previously reported, 1987 net earnings reflect the benefit of tax law changes related to deferred taxes that became payable in 1987 of \$80 million, or \$1.88 per share, for the year, and of \$20 million, or 48 cents per share, for the fourth quarter.

"Gains in our 1987 performance are mainly attributable to the increased production rate of the F-16. 1987 deliveries were 299 compared to 201 in 1986," said Stanley C. Pace, Chairman and Chief Executive Officer. "In addition, results at Cessna Aircraft clearly show the benefits of the extensive restructuring efforts undertaken in the past year at that division."

"Investments made for advanced programs are reducing operating earnings in Military Aircraft in the short term," he said. "We expect that these long-range opportunities will begin contributing to earnings in the early 1990s."

Pace said that Land Systems delivered 947 M1 tanks in 1987 compared to 755 in 1986, marking recovery from the

(Continued on Page 3)

## GENERAL DYNAMICS World

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The First F-16 Produced by Fort Worth for the Republic of Singapore Air Force

## Republic of Singapore Air Force Gets Its First Fort Worth-Produced Fighting Falcon

By Joe Stout

The Republic of Singapore Air Force (RSAF) received its first F-16 aircraft in a ceremony at Fort Worth on Feb. 10th.

Maj. Gen. Winston W.L. Choo, Chief of the General Staff of Singapore's Armed Forces, officially accepted the two-seat F-16B before an audience that included more than 60 RSAF personnel who are in the United States for F-16-related training.

The extensive training effort is one of several aspects of Singapore's F-16 program that make it different from other countries' F-16 purchases.

The Fighting Falcon accepted by General Choo is the first of eight — four F-16Bs and four single-seat F-16As — that the RSAF will receive over the next few months.

"With the F-16, Singapore joins a very select fraternity of nations that have acquired the definitive air force fighter of the 1990s," General Choo said in his remarks at the event.

"The primary mission of the RSAF is to maintain a

deterrent force in the pursuit of peace and stability in our part of the world. The F-16 will be the leading element of that force," he said.

The Hon. J. Bennett Johnston, U.S. Senator from Louisiana, represented the U.S. Government at the ceremony. Senator Johnston referred to the F-16 as "a great machine which is on the cutting edge of technology."

"We are lucky to have an ally such as Singapore (flying the F-16) in the critical Strait of Malacca area," he said, noting the strategic importance of the region.

Singapore is the first nation in Southeast Asia to receive the F-16 and the 12th in the world to add the Fighting Falcon to its inventory. The country is also the first outside the United States to receive airplanes incorporating advanced F-16A/B Operational Capabilities Upgrade (OCU) equipment, including enhanced avionics and provisions for beyond-visual-range missiles.

(Continued on Page 2)

## Singapore Aircraft Was the 2,000th F-16 Built

The F-16 that Fort Worth delivered to the Republic of Singapore Air Force Feb. 10th was the 2,000th Fighting Falcon produced worldwide since the first U.S. Air Force F-16 was rolled off the assembly line in 1978.

The F-16 program is the largest international military coproduction effort in history. At the time of the 2,000th delivery, Fort Worth had produced 1,583 F-16s, Fokker in the Netherlands had produced about 240, and SABCA/SONACA in Belgium had produced approximately 180.

TUSAS AEROSPACE INDUSTRIES, INC., in Turkey, delivered its first F-16 last November.

Of the 2,000 F-16s produced, about 620 have been F-16C/D aircraft. The F-16C/D was introduced in 1984.

Approximately 1,260 F-16s have been delivered to the U.S. Air Force.

The F-16 program has remained on or ahead of schedule and within predicted costs throughout its history.



## Employees Honored for Reaching Half-Century Mark With the Company

Four employees who have passed the 50-year mark for service with General Dynamics were honored by company officials at a dinner in St. Louis Jan. 28th.

Host for the event was Stanley C. Pace, Chairman and Chief Executive Officer, who presented the employees with plaques commemorating their service anniversaries.

The dinner also was the kickoff for an extensively revised service award program in which a new category was added for 50 years' service. Under the recently updated program, the four veteran employees received items they selected from a new company gift brochure.

The honorees and length of service are:

**Bess P. Elias**, Manager of Private Payroll and Benefits at Material Service Corporation, 52 years.

**Arnold I. Sobel**, Vice Chairman of Material Service, 51 years.

**Robert E. Bruce**, Engineering Specialist at Space Systems Division, 50 years.

**Frank Machado Jr.**, Principal Engineer at Electronics Division, 50 years.

Among the General Dynamics officials attending were: Herbert F. Rogers, President and Chief Operating Officer; Lester Crown, Executive Vice President and Chairman of Material Service; Gerald R. Nagel, President of Material Service; Dr. Leonard F. Buchanan, Corporate Vice President-Technology Development and Engineering; James J. Cunnane, Corporate Vice President and Controller; Robert H. Duesenberg, Corporate Vice President and General Counsel; B. Edward Ewing, Corporate Vice President-Operations; Arch H. Rambeau, Corporate Vice President-Human Resources; Melville R. Barlow, Corporate Vice President and Electronics General Manager; and Dr. Alan M. Lovelace, Corporate Vice President and Space Systems General Manager.

Pace said that the service recognition dinner was the first held by the company and that it would be followed by similar 50-year anniversary events in coming years.



**Veteran Employees Honored.** Stanley C. Pace, Chairman and Chief Executive Officer (far left), presented plaques recently to four General Dynamics employees who have passed the 50-year mark in service to the company. Honored were (left to right): Arnold I. Sobel, Vice Chairman of Material Service Corporation; Bess P. Elias, Manager of Private Payroll and Benefits at Material Service; Robert E. Bruce, Engineering Specialist at Space Systems Division; and Frank Machado Jr., Principal Engineer at Electronics Division.

said the service award program has been enhanced by a number of changes, including a new and wider selection of gifts. Employees who reach the five-year service level and each five-year level above it through the 50-year mark will be able to select a service pin, jewelry or a non-jewelry gift item for that level from a special service award brochure.

Some of the features of the revised program, Groh said, are:

- a mix of unique jewelry and specially designed gifts at each five-year anniversary level.
- increased value of gifts at each anniversary level, and

- tasteful company identification on each award.

Under the previous program, service awards had been presented to recognize employees for their cumulative years of service, Groh said, but the awards had been limited to service pins and small jewelry items.

Details of the upgraded program are being finalized and will be provided soon, Groh said. Employees who reach a service anniversary level this year will be given more specific information about the program, he said. This will include a new four-color brochure and selection form currently in production.

## Weather Spacecraft Launched by Atlas E At Vandenberg AFB

Atlas 54E successfully launched an Air Force Defense Meteorological Satellite Program (DMSP) spacecraft into a near-polar orbit from Vandenberg Air Force Base on Feb. 2nd. This was the fourth of six DMSP spacecraft identified to be launched on an Atlas E vehicle.

Through the DMSP, military weather forecasters can detect and observe developing patterns of weather and can track existing weather systems over remote areas including oceans. A 450-nautical mile sun-synchronous orbit enables the satellite to completely cover the earth's surface every 12 hours. While the primary mission of the meteorological satellite program is gathering weather data for military uses, its information is also made available to the civilian community through the National Oceanic and Atmospheric Administration (NOAA).

This was the 17th successful Atlas launch in a row from Vandenberg, including three NOAA satellites, four DMSP satellites, four Navstar Global Positioning System spacecraft, one Geosat and five classified payloads. A total of 270 Atlas missions have flown from Vandenberg since the first one in September 1959.

After 54E, nine Atlas launch vehicles remain to fly from Vandenberg. Atlas 54E, as with all Atlas Es, was originally built and delivered to the Air Force as an intercontinental ballistic missile. It was modified and refurbished by the Space Systems team and delivered to the Air Force Space Division for use as a space launch vehicle.

## Last of Fort Worth-Built F-16s Flown to Turkey

The final delivery cell of four Fort Worth-built Turkish Air Force F-16s was recently flown from Carswell AFB, Texas, to Murted Air Base, Turkey.

The ferry flight included two F-16Cs and two F-16Ds. With the delivery last year of four F-16Ds from the division, it completed the eight Turkish airplanes scheduled to be produced at Fort Worth.

The remaining 152 aircraft in Turkey's order of 160 will be delivered from the TUSAS AEROSPACE INDUSTRIES (TAI) factory in Murted. TAI delivered its first F-16 last November.

## Singapore Air Force Receives Its First F-16

(Continued from Page 1)

Singapore's aircraft are equipped with the Pratt & Whitney F100-PW-220 engine, an upgraded version of the original F-16A/B powerplant.

Maj. Gen. Robert D. Eaglet, the Aeronautical Systems Division's F-16 Program Director, and Brig. Gen. Donald L. Kaufman, Director of International Programs at Air Force Headquarters, represented the U.S. Air Force at the delivery.

"There are now 12 air force chapters in the Fighting Falcon legacy," General Eaglet said. "General Dynamics can be justifiably proud that its design has enjoyed such a high degree of acceptance over so long a duration, in a highly competitive environment."

General Kaufman commended the many Fort Worth employees who were present, "for producing the finest

aircraft in the world."

Herbert F. Rogers, President and Chief Operating Officer, and Charles A. Anderson, Vice President and Fort Worth General Manager, represented the company. Anderson served as master of ceremonies.

"This is a proud day for General Dynamics," Rogers said. "General Dynamics is confident that the F-16 will serve Singapore's defense needs very well."

On Feb. 11th, the initial Singapore aircraft was flown to Luke AFB, Ariz., where the country's F-16s will be based for two years while more than 100 members of the RSAF receive operations and maintenance training. The training will be conducted by the USAF and General Dynamics.

The RSAF requested the U.S. training program because of limited ground and air space for such an effort in Singapore.



**Singapore Ceremony.** Gen. Winston W.L. Choo, Chief of the General Staff of Singapore's Armed Forces, speaks at a ceremony marking the first F-16 delivery to the Republic of Singapore Air Force. The aircraft shown at the ceremony site is the second produced for Singapore. The first was displayed outdoors.

## Dutch Firm Picks Up Option for Six Cessna Caravan IIs

Aviation Lease Holland B.V. is increasing its fleet of Cessna Caravan IIs to 18 by exercising its option for six more of the twin-turboprop cargo aircraft.

The Dutch company had ordered 10 Caravan IIs last year, with the option for six more. An associate company,

Air Finance Holland, operates two Caravan IIs.

Martin Duijvestijn, Managing Director of Aviation Lease Holland, based at Teuge Airport, said the new aircraft will be used in the rapidly expanding airfreight business in Europe.



## Cessna Produces 1,500th Citation Business Jet Aircraft at Its Wichita Plant

The 1,500th Citation business jet produced by Cessna Aircraft Company has been delivered to Executive Jet Aviation (EJA) of Columbus, Ohio.

In a ceremony at the Wichita, Kan., plant, the Citation S/II was accepted by EJA Chairman Richard T. Santulli and Executive Vice President John D. McPhelimy.

It was the twelfth Citation delivered to EJA, the world's largest business jet charter and aircraft management company, which has nine more Citation S/II's on order and holds options for 12 more. EJA also operates three Citation III's.

On the average, Cessna has delivered 100 Citations a year since the first one entered service 15 years ago. The active Citation fleet is the largest business jet fleet in the world. In addition to the 1,500 commercial Citations, there are 15 Citation T-47s in service with the U.S. Navy.

Since 1963, Executive Jet Aviation has flown more than 100 million miles and carried 300,000 passengers.

EJA officials say their company's fleet flies some eight million miles per year — one fifth of the 40 million miles flown by U.S. business jet charter operators. They project the industry total will reach 150 million miles annually in the next five years.

Santulli said rapid customer acceptance of the Citations, their low cost of operation, exceptional dispatch reliability and safety record were major factors in EJA's decision to expand its Citation fleet.

Santulli also said the Citations' ability to operate in and out of smaller airports is enabling EJA to significantly expand its service to dozens of cities and towns. And he said their quiet engines permit the Citations to serve many airports during night curfew hours.

About 5,000 U.S. airports are usable by the Citations, compared to 300 used by the airlines.



Cessna Aircraft Company's Citation S/II Business Jet

Since 1979, Cessna has led the general aviation industry in sales of business jets by delivering more than 950 Citations.

The Citation fleet logged its four-millionth flight hour in December. A Citation takes off on a business mission every minute of every day, and the fleet averages more

than 2,000 flight hours per day.

In 1986, Cessna was awarded the Robert J. Collier Trophy for the unparalleled safety record of the Citation fleet. The nation's highest aviation award had never been presented to a general aviation company in its 75-year history.

## NMA Chapters Honor High School Students At Dr. Martin Luther King Jr. Day Observance

Four high school students from Pomona, Calif., were honored recently for speeches they wrote and presented at a luncheon of the Black History Observance Committee of the Pomona and Valley Systems chapters of the National Management Association (NMA). Attending were 162 General Dynamics employees, family members and friends.

February is Black History Month.

The luncheon was held in Pomona at the chapters' seventh annual birthday celebration and remembrance in honor of slain civil rights leader Dr. Martin Luther King Jr. The committee also formalized plans for the events in observance of Black History Month.

Theme for the national observance is "Ending Violence, Poverty, Hunger, Apartheid, War and Terrorism through Creative Non-Violent Action."

Students who won certificates and U.S. Savings Bonds for their speeches on various aspects of that theme were Jo Yang and Robert Altman of Diamond Bar High School and Ginean Lewis and Angela Reeves of Ganesha High School.

The area speech contest was judged by the Black History Observance Committee, sponsor of the contest.

Ray A. Inge, chairman of the committee who also is NMA Minority Awareness Manager, was the keynote speaker at the luncheon. He spoke of the progress that has and has not been made since the death of Dr. King 20 years ago and also called for the nation to continue to invest, develop and utilize America's most powerful resource — its people.



**Dr. King Remembered.** Four winners of a speech contest were honored recently by the Black History Observance Committee of the Pomona and Valley Systems chapters of the National Management Association. One of the students, Jo Yang, is shown receiving a certificate of outstanding achievement and a \$100 U.S. Savings Bond from Ray A. Inge, chairman of the committee. February is Black History Observance Month.

### Our Commitment To Society

- We will act as responsible and responsive corporate citizens and in a moral, ethical and beneficial manner.

(From the General Dynamics Standards of Business Ethics and Conduct.)

## St. Louis Variety Club Cites Chairman Pace

Stanley C. Pace, Chairman and Chief Executive Officer, has been named the St. Louis Variety Club's Man of the Year.

Pace was cited for his contributions to the community as a business and civic leader and the encouragement and support General Dynamics has provided in promoting the welfare of children in the St. Louis area.

He will be honored at the club's 22nd annual "Dinner with the Stars" Mar. 5th in St. Louis. The dinner will precede the national Sammy Davis Jr. Variety Telethon.

## Company Announces Records in Earnings and Sales for Past Year

(Continued from Page 1)

technical problems experienced in 1986. Profit margins declined in 1987, reflecting those recovery costs, as well as investment costs in the Abrams Recovery Vehicle. Earnings at Electric Boat decreased during 1987, reflecting increased costs on the SSN 688 program, he said.

The company's funded backlog was \$17.0 billion and total backlog (funded and unfunded) was \$22.8 billion. Comparable amounts at the same time in 1986 were \$16.8 billion and \$22.5 billion. Not included in the 1987 backlog is the recent \$4.4 billion contract award that General Dynamics shares with McDonnell Douglas for development of the U.S. Navy's Advanced Tactical Aircraft (ATA) and the \$644 million contract the company received for construction of the Navy's 15th Trident submarine.

"New contracts received in 1987 gave us a strong foundation for growth in an increasingly competitive environ-

ment," Pace said. "Some of these awards ensure significant production levels in our major defense segments; others open important areas of business, setting the stage for future programs."

"Without question, the ATA is one of the most important new military aircraft contracts to be awarded in this decade," Pace said. "It was also important that we retain our role as sole builder of Trident submarines — and we did that. Today I believe that we have the most attractive mix of weapon systems of any contractor — one that meets the essential requirements of our military services for the future."

Recent defense contract awards to General Dynamics include:

- A U.S. Navy \$4.4 billion fixed price incentive contract for development of the ATA that was awarded to the team of General Dynamics and McDonnell Douglas after intense competition against another industry team.

The ATA, designated the A-12, is scheduled to begin replacing the A-6 as the Navy's all-weather attack aircraft in the mid-1990s. Work on the ATA will be performed by Fort Worth and McDonnell Douglas, as well as by 40 major suppliers in 35 states;

- The \$644 million award to Electric Boat for construction of the Navy's 15th Trident submarine, scheduled for delivery from the Connecticut shipyard in 1994. The award concludes the first open competition for a Trident since the program for the sea-based leg of the nation's strategic defense triad was initiated in 1974. Electric Boat has delivered eight Tridents. The last seven were delivered ahead of contract schedule;

- An award of \$163.5 million to Pomona for more than 60 percent of the Navy's Fiscal Year 1988 procurement of the Standard Missile. This was the first award under a dual-source policy for this Naval ship-defense system.



## Dramatic Increase Seen in Company's Matching Gifts Program By Dave Lange

A substantial boost in contributions to the General Dynamics matching gifts program is helping local communities in a big way.

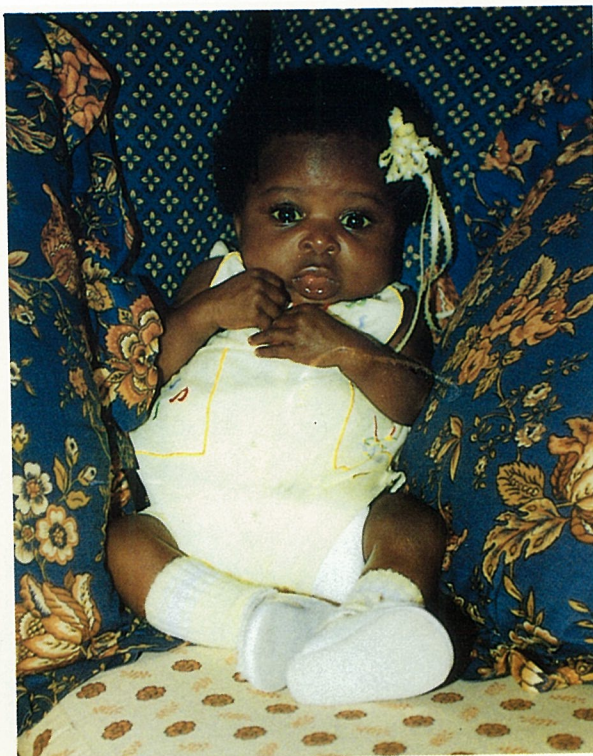
In 1987, the program matched employee gifts of \$668,875 for a total of \$1,337,750 in company and employee contributions to educational, cultural, youth and health organizations. That marked a dramatic 80 percent increase over funds generated by the program a year earlier.

"The big increase in our matching gift contributions reflected a national upward trend among all matching gifts programs in 1987," said Winston C. Gifford, Corporate Director of Contributions.

Education benefited most from the generosity of General Dynamics employees. Colleges and universities in 49 states received money from the program. At Connecticut College in New London — as at most other schools — contributions were channeled where they were needed most. "The gift goes right into the budget," said Lois Carlson, Acting Director of Development at Connecticut College, a private liberal arts institution that received donations from General Dynamics' matching gifts program. "Eighty percent of our revenue is from tuition and room and board. Matching gifts help raise that other 20 percent."

Matching gift money accounts for nearly a quarter of the \$3 million annual fund at Texas A&M University. The annual fund helps a wide range of programs, including monetary awards to outstanding faculty and recruitment of minority students. "We have an abnormal amount of alumni who are engineers who work for companies like General Dynamics that have great matching gifts programs," said Randy Matson, Texas A&M's Executive Director of the Association of Former Students. "General Dynamics is very important to us, and the matching gifts program is a way for companies like General Dynamics to give back to the schools that supply employees."

The Detroit Symphony, another recipient of General Dynamics' matching gifts, uses the money to underwrite activities such as its outreach program. "The outreach program sends our symphony all around the state so people all over Michigan have a chance to listen," said



**Matching Gift Recipient.** Amber Rowden, 3, of Camden, Ark., will be the recipient of a matching gift by General Dynamics. The company will match the funds, up to \$5,000, raised by employees at the Camden facility. Amber, who desperately needs a liver transplant, was removed from the national donor list recently when her parents, Kenneth and Wilma Rowden, were unable to raise the money needed for the operation.

Paul Papich, the symphony's Vice President for Development.

More than a third of the Detroit Symphony's annual budget comes from donations. "Contributed income is absolutely essential," Papich said.

Matching gift money is also important to the San Diego Zoological Society. "We use the money for projects and

improvements," said Jane Walstrom, the Associate Director of Development. "Our educational programs enrolled 219,000 people from preschool through college in 1987 and our research department is one of the best in the zoo world. We're renovating our old bear grottoes that date back to the 1920s, and we're putting together a Southeast Asian rain forest for some of our tigers. So there's an incredible amount of uses for the money."

General Dynamics contributors are especially generous to the zoo. No other company's matching gifts program generates as much money for the zoo.

The General Dynamics matching gifts program is designed to make gift-giving easy. Full-time employees with at least one year's service can participate, and donations of \$25 or more to eligible organizations are matched by the company. Matching gift forms are available from Employee Services.

Contributors fill out the top part of the form and mail the entire form and donation to the organization of their choice. The organization fills out the remainder of the form and returns it to General Dynamics. The company determines the eligibility of the contributor and the organization and matches all gifts that qualify. The company notifies contributors whose gifts will be matched.

"It's really pretty simple," Barbara Stuart, Corporate Matching Gifts Administrator, said of the program. "If read carefully, the application can be completed in a matter of a few minutes. It sure makes my job easier when the donor fills in all the blanks."

The types of organizations and the matching gift money they received from the company and employees in 1987 consisted of:

Arts and Culture	\$ 104,292
Education - Jr. College	2,862
Education - Foundation	2,950
Education - Secondary	168,438
Education - University	930,830
Health - Hospital	26,140
Health Organizations	53,562
Youth Organizations	48,676
<b>Total</b>	<b>\$1,337,750</b>

## Other Company Divisions Among Electronics' Best Customers By Julie C. Andrews

As a result of Electronics Division's move into the second-source and build-to-print arenas of high-technology electronics systems (designated as "production programs"), sister divisions in General Dynamics are now among Electronics' best customers.

These production programs at Electronics total more than \$50 million in sales, with interdivision programs accounting for 70 percent of that figure.

"Since going into production programs in a big way in 1983," said Wilburn C. Kruger, Production Programs Director, "we have sought out interdivisional business." Using the M1 tank as an example, Kruger noted that Electronics beat out competing companies for the manufacture of circuit card assemblies for the M1, including original suppliers to the tank-building concern before it was acquired by General Dynamics from Chrysler Corporation.

Being a strong competitor on cost and schedule requirements is only one of the reasons that production programs at Electronics are a good fit in the corporate family, said Kruger. "As part of the General Dynamics corporate family, the division is able to capitalize on strong interdivisional relationships to get the job done and solve problems, no matter what," Kruger said.

In addition to the M1 circuit card assemblies, Electronics also makes cables and harnesses supporting Convair's Tomahawk cruise missile program, and panels, cables and harnesses for Fort Worth's F-16 program and

the Pomona-produced Phalanx gun system.

Space products include electronics modules for guidance and telemetry on the Space Systems-built Atlas and Atlas/Centaur launch vehicles. Electronics will build the production units of the space station power inverter hardware recently awarded to Space Systems.

Electronics' Microelectronics Center was dedicated in mid-1984 and makes complex microcircuits for Air Force test equipment programs on the F-16 and B-1B bomber.

The balance of Production Programs output at Electronics goes for support of earlier Electronics Division programs or for direct business with other outside customers.

"We have supported all Electronics products built in the past," Kruger said. "We are still building spares for TACAN systems built in the 1950s and for earlier test set equipment like the test station for the F-111 built in the 1960s."

More than one half of the one million square feet at the Kearny Mesa and Lindbergh Field facilities is reserved for electronics manufacturing, Kruger said. Reserve production capacity enables Electronics to support customers who prefer not to invest capital in facilities to accommodate new program development and production surges for special requirements — a key element of Electronics' marketing strategy as it seeks new customers for its production capability.



**Relay Event.** Yolanda Buan, an assembler at Electronics Division, examines a tiny relay component that will be put in the circuit board in front of her. The circuit board will be installed in the electronics system of a Land Systems M1A1 Abrams tank. Buan and her coworkers produce 16,000 circuit boards every year for the tanks.

## Convair's Computer-Aided Logistic Support Tools Improve Readiness

Convair's Integrated Logistic Support (ILS) is responding to Department of Defense initiatives to improve the readiness of current and future weapon systems. From small, company-funded projects begun in the early 1980s, Convair has continued to develop computer-aided logistic support (CALS) tools and is expanding its efforts under government-funded projects.

"We are actively pursuing the rapid integration of automated reliability, maintainability and supportability design data into the design and engineering process," said Norman E. Tipton, Director of Convair ILS. "Our goal is to develop techniques to streamline complex logistics engineering hardware analysis during design."

Before computer-aided engineering, design and manu-

facturing, engineers had to visualize a finished piece of equipment from a two-dimensional drawing or rely on mockups ranging from artists' renderings to full-scale prototype hardware. Today's CAE/CAD/CAM systems provide an engineer with a clear, three-dimensional understanding of a design's geometric structure.

On their CAD workstation screens, design engineers can "see" the openings in a structure that allow maintenance technicians access to the internal components they must repair and replace. Using CAD models of human maintenance technicians, ILS engineers are able to simulate an entire repair process.

The computer selects the proper tool from a library of standard military tools stored in the data base and simu-

lates whether the "arm" can get to a certain part without running into part of the structure. Designers can verify whether they have designed in sufficient clearance to allow a technician holding a tool to remove fasteners such as nuts, bolts, clips and screws. When the simulation finds that the model arm strikes part of the structure during removal, the designer sees a change in color and shading where the problem exists. If any joint or link of the model arm exceeds normal human limits, the simulation alerts the user by changing the color of the link to red.

Thus, supportability analyses can be done during the engineering design phases so that changes can be made before the design is released to manufacturing.



# F-16 and M1 Tank Given High Praise By President Reagan

President Ronald Reagan praised Fort Worth's F-16 aircraft and Land Systems' M1 Abrams tank in a recent speech he made at a meeting of the Reserve Officers Association in Washington, D.C.

He also referred to the National Aero-Space Plane (NASP), an experimental vehicle to be designed in a program that Fort Worth is working on.

In describing what his administration has done to increase prospects for world peace, Reagan said:

"We've put in the hands of those defending us top quality weapons, like the F-16 and the Abrams battle tank. And perhaps most important to these brave young men and women, to whom we owe so much, we restored the pride this country has in those who wear the military uniform of the United States."

Reagan mentioned the NASP project in discussing the American spirit. He said a NASP-like aircraft will be in routine operation by the end of the next decade and will be able to provide commercial transport from Washington to Tokyo in only three hours.

The F-16 and M1 were the only defense or aerospace industry products mentioned by the President in his half-hour speech.

# Dow Elected '88 President Of San Diego Navy League

H. Cushman Dow, Division Vice President and Legal Counsel for Convair and Space Systems, has been elected 1988 president of the San Diego Council of the Navy League. The San Diego Council is the largest in the world with more than 2,000 members.

The Navy League is a civilian-run, non-profit service organization whose purpose is to support the country's naval and maritime forces through education and motivation. Dow served in the U.S. Navy during World War II.

Savings and Stock Investment Plans			
Annual Rate of Return for the 12 Month Period Ending:			
	Dec. 1985	Dec. 1986	Dec. 1987
<b>Salaried</b>			
Government Bonds	15.3%	10.4%	5.8%
Diversified Portfolio	35.6%	22.5%	6.7%
Fixed Income	12.3%	12.0%	11.4%
<b>Hourly</b>			
Government Bonds	15.4%	10.0%	5.9%
Diversified Portfolio	35.4%	23.1%	7.3%
Fixed Income	12.3%	12.1%	11.4%
<b>GD Stock Closing Price</b>	\$68.75	\$67.75	\$48.75

# Space Systems Ad Wins

A Space Systems recruitment ad has won first place in the 1987 San Diego Union-Tribune Ad '87 Competition, which honors agencies that produce exceptionally good work for newspaper advertising. The award-winning ad, produced by Knoth & Meads Company of San Diego, features a photograph of the giant Easter Island statues and the headline "Will your work leave a lasting impression?" Two Data Systems Division ads, also produced by Knoth & Meads, won an Award of Merit in the same competition.

GENERAL DYNAMICS

# World

Published by: General Dynamics Corporation  
Pierre Laclede Center, St. Louis, Mo. 63105

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# Companywide Employee Survey Reports

Compiled by Sue L. Shike

# Company Approves Additional Flexibility For Its Reward and Recognition System

Survey responses indicated that 53 percent of employees did not understand how promotions or pay increases were determined and 48 percent did not feel that bigger pay increases went to better performers. Employees suggested more objectivity in the appraisal and merit system, more positive incentives to motivate employees and more flexibility in recognition programs.

A Reward/Recognition Action Team, led by Asaph H. Hall, Vice President and General Manager of Data Systems Division, was chartered to address these concerns and provide recommendations to the Executive Office. The team included a variety of employees from the Corporate Office, Data Systems, Electric Boat, Fort Worth and Space Systems.

The team researched and analyzed the company's merit process and recognition programs. It also reviewed the basic tenets of the company's compensation system and concluded that the structure is sound. The team recommended adding flexibility for individual and group recognition and communicating better to employees the objectives and implementation of the compensation process.

This analysis, coupled with input from other industry sources, resulted in four team recommendations that were approved for use in 1988:

- Allow divisions to design and propose unique group incentive programs that could be initiated on a pilot basis. This action would focus attention on building teamwork and provide incentives for group achievements. The Executive Office will consider such proposals from the divisions, but the proposals must be designed carefully to achieve the intended business results and will be thoroughly reviewed by the Corporate Office prior to use.
- Allow division general managers to propose the use of a portion of the divisions' allocated merit funds for lump sum payments to individuals who achieve predetermined goals throughout the year. Guidelines for this optional approach will be included in the 1988 merit review process and will require a corporate/division approved plan of the approach for use of such funds.
- Continue development of the compensation communications program, which will help employees better understand how the compensation system works. A videotape describing the company's compensation system and emphasizing the relationship of performance ratings, rankings and merit pay will be used throughout the company. An executive memorandum will also reinforce management's need to continually inform employees of their performance in addition to holding annual performance appraisals.
- Distribute a description of employee recognition programs to all divisions and improve the administration of the current merchandise program for Extraordinary Achievement Awards. Cash alternatives were not recommended by the team. Administration of the merchandise program will be improved this year and the catalog of division-sponsored recognition programs will be available in the first quarter.

# New Division Approval Procedures in Place

Two changes in administrative procedures have recently been made by the corporation. These changes will increase the authorization limits for the commitment of division-level project funds and provide a streamlined approval process for obtaining domestic consulting services. Both changes promise to reduce the amount of effort spent by the divisions and the Corporate Office in managing the approval cycle, thus lowering administrative costs.

These increased contractual authorization limits approved by the company will more than triple the previous signature dollar limits set for each division and subsidiary. Commitments in excess of the new limits must be submitted to the Corporate Office for approval prior to execution.

The increase in signature authority is the result of a study initiated by Frederick S. Wood, Executive Vice President-Contracts, Pricing and International Offset, based on comments received at the annual conference

held by the Contracts, Pricing and Estimating staff last August. In his 1987 letter authorizing the revised limits, Wood wrote, "The new levels are a reflection of our confidence in the division's competence in handling business commitments." The last general review and change of signature delegation levels was made in 1984.

The change in approval process for domestic consulting agreements became effective Jan. 1st. Final authority on approval of these agreements has been delegated to the cognizant division general managers.

Excluded are agreements for outside legal services, advertising and public relations, public accounting and auditing services and any other consulting services involving the company's public accounting firm. In making the change it was concluded that the Corporate Policy and Procedure 22-302, as well as the required forms and pro forma consulting agreement, provides for an appropriate amount of guidance to each division on the administration of these agreements.

# Company's Frequent Flyer Policy Is Changed

As part of the series of action items dealing with employee survey suggestions, the company's policy that dealt with airline frequent flyer programs now allows employees to accrue frequent flyer miles from company travel to their personal accounts. In the past, frequent flyer miles and awards went to the company.

The change was made because studies showed the old policy could not be administered in a cost-effective manner and there was no net cost benefit that could be accrued to the company or its customers by continuing the current policy.

Consequently, an executive memo signed by Stanley C. Pace, Chairman and Chief Executive Officer, was issued Dec. 10th that modified the company policy and eliminated any company participation in airline frequent flyer activities. However, the memo added that company air travel, carrier selection or related activities will be undertaken solely on business merits, with no regard for impact on frequent flyer programs. In addition, the memo prohibits use of company premises or time for frequent flyer activities such as enrollments, record keeping and ticketing.

# Land Systems and Fort Worth Respond to Unique Concerns

Some benefits items from the employee survey concerned only Fort Worth and Land Systems. Those items were referred back to those divisions for action.

- At Land Systems a special bulletin was issued in October to explain more fully the stop-loss clause of the major medical plan for management and management support.
- Also at Land Systems, additional communication of retirement benefits for salaried employees is under way. In November preretirement seminars were held for management and management support employees over age 50. The seminars emphasized explanation of the retiree medical plan.
- At Fort Worth a suggestion led to a study of the incentives for attendance. The 2-year-old presenteeism program was canceled following the conclusion of a study that determined it was not accomplishing what it was supposed to do.



## Contract Is Awarded For Pomona-Built Standard Missiles

The U.S. Navy has announced that Pomona has been awarded a \$163.5 million firm fixed price contract with performance incentives for production of the Standard Missile-2 for Terrier, AEGIS and Tartar-equipped ships. The work is expected to be completed in 1990.

The award was for 801 units, which represents more than 60 percent of the FY 1988 Standard Missile procurement. The contract also includes options for an additional 60 missiles under the foreign military sales program. A similar contract for the remaining units went to Raytheon.

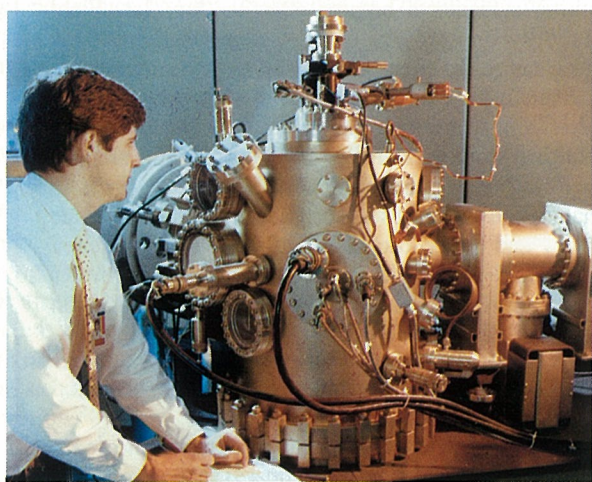
The contract also calls for each contractor to provide 10 Standard Missile-2, Block III guidance control and airframe sets. This is the first Standard Missile production contract in which the two defense companies were in competition for a portion of the total.

Block II is the latest production model in the Standard Missile family that has served as the primary surface-to-air defensive system for the U.S. Navy and allied nation warships for more than 20 years.

Standard Missile is an all-electric, supersonic, tail-controlled anti-aircraft defense system. It provides medium and extended range coverage to the fleet against a variety of missile and aircraft targets. Pomona designed and developed both the medium range and extended range versions. The missile operates from either a deck-mounted rail launcher or, in the case of the newest class AEGIS cruisers, from below-deck vertical launch tubes. Standard Missile-2, Block II vertical launch missiles first became operational in 1986 with successful completion of testing in the AEGIS cruiser USS *Bunker Hill*.

Pomona has delivered more than 16,000 Standard Missiles since production deliveries began in 1966. Last year, the Navy announced it would create a second source producer for the missile, and Raytheon was selected to compete for annual procurements. In subsequent competition, Raytheon was named design agent for the new AEGIS extended range Block IV version. Production contracts for that version are not expected until the 1990s.

Block numbers are used to identify the weapon system's particular production design and configuration. New numbers are assigned to designate improvements or modifications while maintaining common hardware systems.

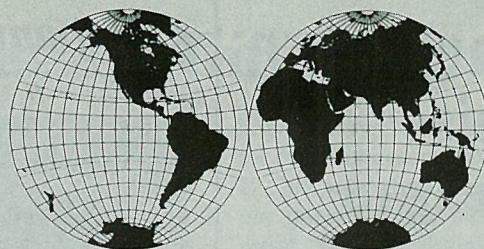


**Growth Project.** Robert T. Conley, a research engineer at Pomona, monitors the growth of gallium arsenide crystal layers in the Molecular Beam Epitaxy System. Gallium arsenide is used to make high frequency semiconductor components such as those used in the microwave guidance system in U.S. Navy missiles.

## Joseph J. Yeats Gets Leadership Award

The American Defense Preparedness Association (ADPA) has presented a silver medal to Joseph J. Yeats, Land Systems Division Manager of Concept Development. The award commended Yeats for his outstanding leadership as Program Chairman, Deputy Chairman and Chairman of the ADPA Combat Vehicles Systems Section for 1979 to 1986.

Yeats organized an effective Government Industry Team that gave ADPA a valuable forum to address issues affecting research, development and acquisition of combat vehicles. "His direction of the annual Combat Vehicles conference made it a focal point for exchanging technical information essential to the vehicles community," the commendation said.



## Around the World

**CHQ:** Ronald C. Giles joined as Corporate Director-Internal Audit . . . Cheryl J. Horn as Manager of Administration/Undersea Warfare Center . . . Daniel T. Elder was promoted to Senior Corporate Tax Accountant . . . Michael F. Tobin to Corporate Tax Administrator.

**Fort Worth:** George M. Kaler was appointed to Information Resources Management Director . . . Olaf Thiede to Material Operations Director . . . Billy F. Abshire was promoted to Engineering Chief . . . Bettie L. Anderson to Manufacturing Control Supervisor . . . Charles S. Bogle, Edward S. Knezek Jr. and William B. Rose Jr. to Project Manager . . . Jay W. Bolton, F. Roden Campbell and Raymond E. Wadsworth to Logistics Chief . . . Jesse H. Cancino to Industrial Engineer . . . J.L. Clark to Tooling Supervisor . . . Stanley J. Effertz and Benjamin C. Smith to Contract Administration Manager . . . John R. Gillilan to Assembly Manager . . . Daniel C. Gilmore to Development Resources Manager . . . George W. Gruver and James G. Rider to Engineering Program Manager . . . Joe T. Harp to F-16 Programs Manager . . . Karen L. Johnson to Manufacturing Control Coordinator . . . Douglas S. Labare and William A. Thomas to Industrial Security Supervisor . . . James L. Lane to Contracts Manager . . . Lloyd W. Mayo to Quality Control Engineering Specialist . . . Frank McBroom to Manufacturing Engineering Specialist . . . Judy K. McClurkan to Technical Training Specialist . . . Cresencio Munoz to Tool Design Supervisor . . . Bryan N. Olmstead to Field Service Engineer . . . Jerry D. Palon and James A. Sansone to Project Engineer . . . Robert J. Rigdon Jr. to Material Planning Chief . . . Michael W. Scruggs to Inspection General Supervisor . . . Charles L. Wasson to Inspection Supervisor.

**Convair:** Jerome E. Butsko was appointed to Engineering Director . . . Robin A. Bithell was promoted to Engineering Chief . . . George D. Budy and Michael P. Simundich to Engineering Specialist . . . John A. Campbell to Publications Supervisor . . . Charles D. Finch, Michael P. Kenney, Donald R. Seggie and Edward A. Washer to Quality Assurance Supervisor.

**Space Systems:** Madan M. Bera was promoted to Senior Engineering Specialist . . . Randal M. Abeyta, Cary R. Christopherson, Richard J. Elling, Brian D. Johnson, Gregory J. Kilbury, Octavio L. Mamon, Michael McDonald, Karle B. Meyer, Jr., Phillip H. Yee and Frank C. Zegler to Engineering Specialist . . . Samuel L. Wagner to Cost Development Engineering Specialist . . . Kip B. Chambers to Administrative Chief . . . James E. Morton and Phillip Whisnant to Plant Engineering Specialist.

**Electronics:** James E. Flynn was appointed to B-1B Intermediate Automatic Test Equipment Program Director . . . Joseph L. Roberti and Rex W. Tracy to Engineering Director . . . Kevin J. Harkenrider to Operations Director . . . Robert L. Beers and Paul R. Salopek II were promoted to Program Manager . . . William M. Filipowski, Vernon G. Harvester and Richard L. Thompson to Engineering Manager . . . Edwin P. Langmaid to Safety Manager . . . Frederic C. Louderback to Marketing Manager . . . Cynthia L. Henson to Management and Administrative Systems Manager . . . John M. Kesser, Dennis M. Spurr, Jerald T. Stebbins, Floyd D. Troxler, William B. Walker, Michael V. Warlick, Bradner L. Windsor and Ralph A. Yates to Engineering Section Head . . . Shirley O'Shea to Senior Management Systems Analyst . . . Mibs B. Prickett to Engineering Administration Section Head . . . Patricia A. Homes to Quality Assurance Engineer . . . Eileen McMenamin to Test Engineer . . . Evelyn M. Carpenter to Material Analyst . . . Judy M. Key, Richard B. Sack and Martha N. Urevig to Quality Supervisor . . . Stephen L. Rosenbaum to Material Supervisor . . . Denise M. Benedict to Senior Financial Analyst . . . James P. Higashi and James E. Lechner to Operations Section Head . . . Randy A. Peoples to Operations Test Engineer . . . Michael L. Kropf to Senior Systems Engineer . . . Van Anh Le to Operations Supervisor.

**Electric Boat:** Charles E. Aldrich was appointed to Advanced Systems Development Director . . . Ronald F. Kiely was promoted to Purchasing Manager . . . Robert H. Ames and Kevin J. Poitras to Engineering Chief . . . Dale E. Burnell to Logistics Chief . . . Robert Dahl to Inspection Chief . . . Gregory L. Jordan to Design Services Chief . . . Robert L. Heldreth to Plant Protection Lieutenant . . . Brent S. Bubar and Howard H. Hopps to Engineering Supervisor . . . John J. Adas to Engineering Writer Supervisor . . . Claude L. Routhier to Design Supervisor . . . Henry Olexy and Robert Samokar to Senior Trade Planning Supervisor . . . John L. Nickolenko to Trade Planning Supervisor . . . Paul M. Olivo to General Foreman . . . Allen Hynek to Foreman . . . Thomas F. Concannon to Chief Test Engineer . . . Bretton Sullivan to Group Trade Planner . . . At Quonset Point, Manuel Maderia to Traffic & Transportation Chief . . . Janet E. Byrne to Material Control Supervisor . . . At Charleston, Eugene Brown to Quality Assurance Chief . . . Robert Bivens to Foreman . . . At Idaho, Frank L. Muraco to Assistant Superintendent . . . Royce N. Browning to General Foreman . . . Alan W. Brown to Foreman . . . At Kesselring, Thomas M. Gauvin to Assistant Superintendent.

**Land Systems:** June L. Beers was promoted to Employee Benefits Manager . . . Ravi K. Dhar to Quality Control Senior Supervisor Engineer . . . Wayne O. Lockwood to Program Management Chief.

**Pomona:** David J. Anderson was promoted to Quality Assurance Project Administrator . . . James A. Busch to Plant Engineering Chief . . . Richard D. Garwacki to Quality Assurance Chief . . . Kirk A. Huelle to Electronics Engineer . . . Linda L. Morse to Senior Quality Assurance Specialist . . . Constance M. Pasqualetto to Material Control Chief . . . Delores Ornelas to Staff Assistant . . . Michael H. Robson to Section Head . . . Kimberly S. Sibbet to Manufacturing Supervisor . . . Victor D. Spatafora to Senior Electronics Engineer . . . Dan L. Wietecha to Test Engineer . . . Jackie G. Hutcheson to Engineering Writer . . . Paula S. Jones to Manufacturing Analyst . . . David L. Daniell to Senior Manufacturing Engineer . . . Maria Y. Brown to Senior Quality Assurance Representative . . . Mary A. Scrape to Senior Engineering Planner . . . Robert C. Jackson to Design Specialist . . . Dwight O. Holland to Senior Test Manufacturing Engineer . . . Chris Jones to Senior Electronic Engineer . . . James E. Munds to Senior Programmer/Analyst . . . Mary Green to Quality Assurance Supervisor . . . Charles R. Cates to Purchasing Agent . . . Jethro Thompson to Project Representative.

**Valley Systems:** Russell L. Jackson was promoted to Cost Control Chief . . . James D. Murphy to Project Engineer . . . Raymond Perez to Offset Business Development Manager . . . Helmut E. Sonnenburg to Senior Project Engineer . . . Steven F. Swen to Group Engineer.

**GDSC:** Michael J. Dupree was appointed to Detroit Operations Director . . . Barton P. Crews and Robert N. Hancock were promoted to Project Manager . . . Manuel Guzman to Senior Logistics Systems Analyst . . . Donald G. Miller to Senior Aircraft Specialist.

**Data Systems:** At Central Center, Nancy J. Warren was promoted to Administrative Assistant . . . At Eastern Center, Richard F. Elston to Operation Services Supervisor . . . Debra A. Selbe to Business Systems Development Supervisor.

**Cessna:** William F. Wenzlaff was promoted to Engineering Technical Manager . . . Seerley Lowery to Advanced Manufacturing Planning Project Manager . . . Edmund D. Pack Jr. to Environmental Resources Manager.



## Federal Express Corp. Orders 90 Additional Cessna Caravan I Aircraft

Federal Express Corporation has ordered 90 additional Caravan I aircraft from Cessna Aircraft Company for use in Federal Express' expanding overnight cargo feeder system.

Four aircraft per month will be delivered under the new contract that begins in May. The last aircraft will enter service in August 1990.

Federal Express has ordered 200 Caravan Is, 98 of which have been delivered. The overnight delivery pioneer initially ordered 30 of the Cargomaster version and put the first one in service in March 1985.

FedEx later ordered nine more Cargomasters and exercised an option for 70 of the larger Super Cargomaster model. The new contract is also for Super Cargomasters.

The Caravan Is have been used to expand the Federal Express system to smaller cities and towns throughout the United States and in Canada. Last summer, FedEx began operating the big single-engine turboprops in France, where three aircraft are now in service. Two Caravans began serving FedEx customers recently in Hawaii.

The Federal Express fleet of Caravan Is has logged more than 80,000 flight hours while achieving a dispatch reliability rate of 99.7 percent.

The Caravan I recently became the first single-engine aircraft certified by the Federal Aviation Administration



Two Caravan Is, One in Federal Express Colors and the Other Still Unpainted, Sit on the Ramp at Wichita, Kan.

for Category II operations. Using this Supplemental Type Certificate (STC), FedEx will equip 104 of its Caravans to make landing approaches in low-visibility Category II weather conditions.

More than 175 Caravan I utility turboprops are in

service worldwide, many of them hauling cargo and passengers to undeveloped airports in remote areas. Several operators, including the Royal Canadian Mounted Police, use the floatplane version of the Caravan I.

## SAC Chief Praises FB-111 Modernization Program at Fort Worth Plant

Fort Worth-built FB-111s upgraded under the division's FB-111 Avionics Modernization Program (AMP) are now being flown from Pease AFB, N.H., and Plattsburgh AFB, N.Y.

The Pease AFB unit, which received its AMP airplanes first, credited avionics enhancements made under the program with the successful performance it registered in last year's Strategic Air Command (SAC) Bombing and Navigation Competition. Pease's 509th Bomb Wing won SAC's Most Improved Unit trophy for 1987.

Fort Worth received the FB-111 AMP contract in 1983. Gen. John T. Chain Jr., Commander in Chief of SAC,

recently wrote the following letter to Stanley C. Pace, Chairman and Chief Executive Officer, in praise of Fort Worth's performance in the AMP effort:

"Please convey my sincere appreciation to the General Dynamics personnel of the Fort Worth Division, who supported the F/FB-111 Avionics Modernization Program (AMP). Their commitment to excellence was the cornerstone to an on-schedule and successful upgrade to the FB-111 weapon system.

"From the very beginning, this program was on a 'fast track' with concurrent development of hardware, software, technical publications, etc. The professional expertise,

tireless dedication and cooperative spirit of the General Dynamics team made this modification possible and highlights the F/FB-111 AMP as the 'model' for future reliability programs. General Dynamics has made a significant improvement to the warfighting capability of the FB-111 and Strategic Air Command, enhancing our national security.

"This caliber of performance exemplifies the highest professional standards and should not go unnoticed. Please personally recognize the achievements of Dr. George L. Davis (Division Vice President-F-111 Programs) and all his team members."

## Pomona Program Emphasizes the Needs of the Hearing-Impaired

By Larry Elwell

Pomona employee Rodney J. Agliam, an assembler in Phalanx Production, works in a fast-paced environment. He quickly and professionally assembles signal generator modules amidst the clamor of a typical factory. His hands almost sing as they run over his work with the speed and care of a watchmaker.

Agliam does not sing with his hands, but he does talk with them. He is one of 20 hearing-impaired employees at the division.

Although deaf individuals have been working at the division for more than 20 years, a formal hearing-impaired program did not start until six months ago. Known as the

Hearing-Impaired Support Program, it is run by Diane L. Jones, Hearing Impaired Services Specialist.

Her main responsibilities are to interpret, develop special programs and assure that all hearing challenged employees receive equal access to the same division opportunities as other employees. Jones also teaches a sign language class sponsored by the division's chapter of the National Management Association.

"It's natural for someone to overlook a person who has this impairment," Jones said. "In the past, a person who cannot hear may have been left out of a meeting which he or she needed to attend. Now that I'm available to inter-

pret, this doesn't happen."

Jones explained that she spends much of her time orienting employees to the needs of hearing-impaired individuals. She also has worked in sessions during the Production Supervisory Development Course.

"This program is an avenue of understanding between the hearing and the hearing impaired," Jones said.

"I explain to the supervisors how to communicate with a deaf person," Jones said. "I encourage them to use gestures and to write notes if necessary. But, most importantly, I tell them not to treat hearing-impaired people differently, but to recognize they have special needs."

Hearing-impaired employees are working in tin dipping, soldering, paint component preparation, technical illustration and data entry. Additional individuals are being sought through local training centers.

Jones works with the employees and management of all the areas where deaf individuals work. Within these specific areas she helps develop a productive environment. "I look for opportunities to improve the environment so that both supervisor and employee can maximize their efficiency," she said.

Curtis A. Maddock, Manager of Phalanx Production Line, was instrumental in bringing the evolutionary changes to the hearing-impaired program. "Years ago when I was working on the Redeye program, we had four hearing-impaired individuals working with us," Maddock said. "So last year when one of my supervisors had the chance to hire Agliam onto the Phalanx production line, I encouraged her to do so."

That supervisor, Elaine H. Butler, noted that she was apprehensive but her fears were soon put to rest. "The first day I knew he would be all right," she said. "He began building filters and he worked faster than almost anyone I have ever seen."

Michael K. Shannon, who is hearing-impaired, said many people misunderstand deafness and often ask him outlandish questions. "Because I am a deaf person, someone once asked me if I had deaf children," he said.

Paul Windfeldt, another hearing-impaired coworker, has had similar questions posed to him. "Someone asked me how I got to work and I told him I drive," he said. "He then asked me how a deaf person can drive and I just said the same way as a hearing person does . . . with the radio turned up."



**Communication Aid.** Diane L. Jones (right), Hearing Impaired Services Specialist at Pomona, explains to Ruby Hernandez, a technical illustrator, how to use the Telecommunication Device for the Deaf (TDD). The device allows individuals to communicate over the phone. The division will be installing a TDD in each department where a deaf employee works.



## Submarine Topeka Is Christened, Launched at Electric Boat By Dave Lange

Elizabeth H. Dole has served in many government offices and has participated in many ceremonial functions. But she was uncertain that this wealth of experience had prepared her completely for her assignments at the Groton, Conn., shipyard of Electric Boat on Jan. 23rd.

"In my career, I've sold three railroads and been the first woman to head a branch of the armed services (the Coast Guard)," said Mrs. Dole, a graduate of Harvard Law School, a former Secretary of Transportation and presently campaigning for her husband, the Hon. Robert Dole, senior U.S. Senator from Kansas and a presidential candidate. "But I can assure you that I have never, ever launched anything larger than a rowboat."

However, Mrs. Dole executed her duties flawlessly as principal speaker and sponsor of *Topeka*, the SSN 688-class nuclear fast-attack submarine that is certainly bigger than a rowboat.

After pronouncing the traditional words to launch a ship — "In the name of the United States, I christen thee *Topeka*. May God bless her and all who sail in her." — Mrs. Dole swung a bottle of champagne that shattered against a metal striker bar attached to the bow of the ship. Almost instantaneously Dr. Donald Kent, retired Electric Boat Medical Director who served as triggerman for the launch, pulled the lever that released the *Topeka* from her supports, and the 6,900-ton submarine slid quickly down the greased ways into the Thames River.

The launching of the 25th EB-built *Los Angeles*-class submarine attracted 3,463 spectators, about 50 media representatives and many dignitaries besides Mrs. Dole. The onlookers included a delegation from Topeka, Kan., the state capital for which the submarine is named, and former crewmen of the light cruiser USS *Topeka* (CL 67) that earned battle stars in World War II and the Vietnam conflict.

The current *Topeka* will carry 127 crewmen and a complement of torpedoes and cruise missiles. The ship



**Submarine Christened.** Elizabeth H. Dole smashes a champagne bottle on the striker plate of the *Topeka* during launch ceremonies Jan. 23rd. Watching are (from left) Vice Adm. Bruce DeMars, Assistant Chief of Naval Operations for Undersea Warfare; Douglas S. Wright, Mayor of Topeka, Kan.; Chairman and Chief Executive Officer Stanley C. Pace; Mildred Murphy Wallace, Matron of Honor; and the Hon. Nancy L. Johnson, U.S. Congresswoman from Connecticut's Sixth District.

represents a part of the nation's defense that has gained in importance with the recent signing of the Intermediate Nuclear Forces (INF) treaty that bans medium-range nuclear missiles in Europe.

"No matter what treaties are signed, no matter what

foreign leaders say, no matter what guarantees are made, the Free World must be certain that it is adequately defended," said Chairman and Chief Executive Officer Stanley C. Pace, master of ceremonies for the launching. "The *Topeka* helps provide that defense."

Spectators also heard from Mrs. Dole; Vice Adm. Bruce DeMars, Assistant Chief of Naval Operations for Undersea Warfare; Fritz G. Tovar, Electric Boat Vice President and General Manager; the Hon. Nancy L. Johnson, U.S. Congresswoman from Connecticut's Sixth District; and Douglas S. Wright, Mayor of Topeka. Joining them on the dais were Rear Adm. John Claman, Supervisor of Shipbuilding at Groton; Rear Adm. Walter Cantrell, Deputy Commander for Submarines, Naval Sea Systems; Rev. Frederick Hollomon, who blessed the ship; and Mildred Murphy Wallace, Mrs. Dole's matron of honor.

The speakers praised Electric Boat's workers and the Navy's submarine force and echoed Pace's comments about the *Topeka*'s role in the wake of the INF treaty.

"The men and women of Electric Boat are a national asset of extreme importance," Admiral DeMars said. "They must and do build in quality in their ships. They are a prime factor in the continued submarine superiority of this country."

Added Congresswoman Johnson, "As we move into a new world of arms agreement, ships like the *Topeka*, the men who man her and the men and women who construct her have a greater responsibility that our children and grandchildren live under the same liberty and the same hope for the future that we have enjoyed in our lifetime."

Mrs. Dole lauded the pride of craftsmanship among New England's workers that is evident in the *Topeka*. "Connecticut's commitment to the nation's strength and security is itself an honored tradition," she said. "I'm certain that the *Topeka* will live up to this heritage."

The prospective commander of the *Topeka* is Cmdr. Timothy M. Reichert. The ship will undergo about a year of post-launch construction and testing before it is commissioned by the Navy.



The *Topeka* Slides into the Thames River after Her Launching at Electric Boat

## Space Systems Is Awarded Contract for Space Station Power Inverters

Space Systems has been awarded a contract to build 94 power inverters for the space station electrical power system in a program projected to be worth \$150 million.

NASA awarded four major space station work packages at the end of 1987. The work package for the electrical power system, including electric power generation, conditioning, storage and distribution systems, was awarded to the Rocketdyne Division of Rockwell, whose team includes Space Systems, Ford Aerospace, Lockheed, Allied Signal and Harris.

The space station baseline configuration incorporates a hybrid power generation design including photovoltaic and solar dynamic power. Space Systems will design and build power inverter units that will interface with these primary power sources, condition the primary power to 20 kHz and distribute electrical power throughout the space station to a variety of users.

The concept of 20 kHz power conversion was developed

jointly by Space Systems and NASA.

"Program-related research and development work began in 1978 to define the power system technology appropriate to an orbiting space station," said Dennis W. Lieurance, Space Station Power Systems Program Manager. "As an outgrowth of the definition phase, we found that high frequency technology held the most promising possibilities."

The innovative 20 kHz power conversion system produces greater circuit efficiency and significant savings in size, weight and cost over conventional power sources like the typical 400 Hz power systems found on aircraft or ships, according to James W. Mildice, Chief Engineer for the Power System Program. These savings are especially significant in a structure the size and function of the space station, Mildice said.

"Today's state of the art would allow losses in power conversion for a system in the 12 percent range," Mildice

said. "With our system we're expecting only 5 percent power loss, based on testing to date."

The 20 kHz power inversion system is designed to be flexible so that it can interface with a variety of prime power sources on the space station, batteries or with the space shuttle power system. The system will supply power to whatever frequency needed for the wide range of space station users. The space station's power system must accommodate scientific and industrial users, communications and computational requirements as well as the basic environmental needs.

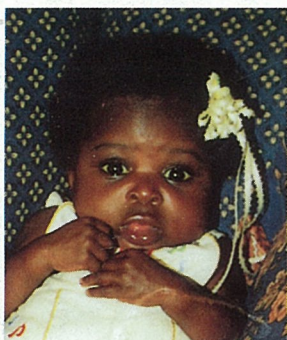
During the initial phases of the program, Space Systems will deliver breadboards and engineering models for testing. The power inverters will each weigh about 200 to 300 pounds and will be approximately the size of a bookcase. Electronics Division will build the actual production units.



# Camden Employees Led Successful Fund Drive for Amber Rowden By Larry Elwell

Amber Rowden of Camden, Ark., tips the scales at only 10 pounds, but she has the weight of an entire community behind her. Area residents, with the leadership of Pomona's Camden Operations, recently raised the money needed for her to undergo a lifesaving liver transplant.

Camden employees later were praised for their spearheading of the fund drive. Larry Woodard, President of the Arkansas Children's Hospital Foundation, Inc., **Amber Rowden** stated in a recent letter, "I wish there was some type of national award that could be given to General Dynam-



ics . . . for the commitment and caring that has been shown to Amber."

The 1-year-old girl is recovering at a hospital in Omaha, Neb., after more than \$170,000 was raised for her operation. However, according to William H. Neal, Division Vice President and Camden General Manager, the child faced the possibility of not receiving a new liver.

"For several months, two men were trying to raise \$130,000 needed for the transplant, but their efforts were local and the media had not yet picked up their story," he said.

Neal said the situation became complicated when Amber, the daughter of Kenneth and Wilma Rowden, was taken off the national donor's list because there was not enough money for her family to make a down payment for the transplant.

"As a result, Ron West, a local disc jockey and fund-

raiser for Amber, contacted Paula Powell, a Human Resources representative at Camden Operations, to discuss General Dynamics' involvement in the fund-raising cause," Neal said.

The Camden ConTrib Club also was considering possibilities to involve the plant in the effort. "We searched the ConTrib bylaws to check specifically how we could help," said Michael Crutchfield, purchasing agent and ConTrib board member. "But this was such a big campaign that it went straight to Mr. Neal and then to the employees."

As a result, Ron Hill, Manager of Human Resources, met with Neal, who not only approved the fund-raiser but agreed to have the company match employee donations up to \$5,000.

Neal announced the fund-raiser to the Camden Opera-

(Continued on Page 2)

## Swiss Pick F-16C/D As a Finalist in Their New Fighter Program

An advanced version of the Fighting Falcon, the F-16C/D, has been selected as a finalist in Switzerland's New Fighter Aircraft (NFA) program.

The F-16 will compete against the F/A-18C made by McDonnell Douglas for selection as Switzerland's next-generation military aircraft for the 1990s and beyond.

"We are very pleased to be included on the final list of NFA competitors," said Herbert F. Rogers, President and Chief Operating Officer of General Dynamics. "We will make a maximum effort in demonstrating to the Swiss Government the outstanding combat capabilities and unmatched cost-effectiveness of our aircraft."

"We also look forward to working cooperatively and effectively with Swiss industry in this program should the F-16 ultimately be selected," Rogers said.

The F-16, produced by Fort Worth, is in service with 12 air forces, including the U.S. Air Force along with the U.S. Navy, in 11 nations, and has been selected by the air forces of five additional countries. More than 2,000 F-16s have been delivered worldwide, and there are plans for acquisition of more than 2,000 additional F-16s.

The U.S. Air Force's confidence in the F-16 was reemphasized when the aircraft was chosen in late 1986 to serve as the air defense interceptor for protection of the North American continent. For this purpose, beyond-visual-range (BVR) Sparrow missiles are being added to its weaponry, which also will include Advanced Medium Range Air-to-Air Missiles (AMRAAM) that are in development.

In the U.S. Air Force as well as in other countries where F-16s are or will be deployed, the aircraft serve a variety of air-to-air and air-to-ground roles.

In addition, the F-16 industrial coproduction plan agreed to in 1975 by the United States and four European Participating Governments (EPG) — Belgium, Denmark, the Netherlands and Norway — has been a pacesetter in such cooperative activities and has been hailed consistently as a success.

## Camden Gets Contract For Sparrow Missile Guidance Sections

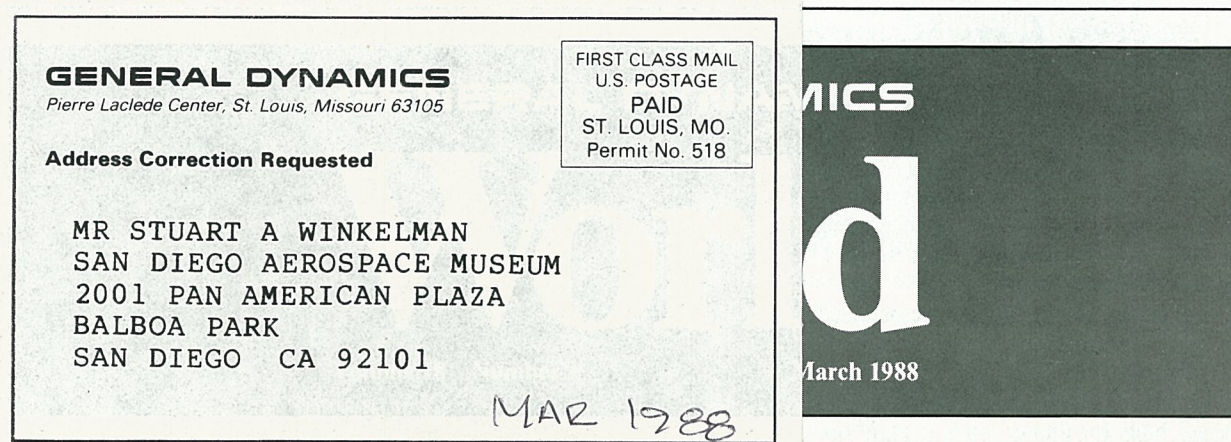
The U.S. Navy has awarded Pomona's Camden Operations a \$147.5 million contract to build 1,444 Sparrow air-to-air and surface-to-air missile guidance and control sections.

The award represents nearly 70 percent of the total 1988 Sparrow procurement award. The Raytheon Company is expected to receive the remaining 30 percent.

William H. Neal, Vice President and Camden General Manager, congratulated employees for their efforts to contain costs while maintaining high quality and a consistent ahead-of-schedule production line. "I'm sure our competitive cost and the tremendous effort by each employee led to this award," he said. "I know we will continue to set an example for the industry in meeting contract requirements."

Camden's majority award was made through a competitive selection process. The contract combines purchases plus spares for the U.S. Navy, U.S. Air Force, Special Defense Acquisition Fund, NATO and the governments

(Continued on Page 2)



**Steep Slope.** An Abrams Recovery Vehicle (ARV) drives down a 60 percent slope during brake tests at the Detroit Arsenal Tank Plant. The vehicle, designed to support the M1A1 Abrams main battle tank in a combat environment, was rolled out of the plant Feb. 12th. The photo shows the ARV as it appeared in a test track mirror.

## Abrams Recovery Vehicle Tows M1A1 Tank To Center Stage in Land Systems Ceremony

The Abrams Recovery Vehicle (ARV), the first derivative vehicle based on the M1A1 Abrams main battle tank, was rolled out of the Detroit Arsenal Tank Plant on Feb. 12th.

Two Land Systems employees pulled back a long blue curtain to introduce the ARV to an audience that included newspaper and television reporters, politicians, union leaders from the United Auto Workers, U.S. Army representatives, Land Systems employees and subcontractors. They watched as the 67-ton recovery vehicle towed an M1A1 Abrams tank to the center of the display area.

"The ARV answers the U.S. Army's need for an armored recovery vehicle that can effectively support the proven and highly reliable Abrams tank in forward combat environments," said Robert W. Truxell, Vice President and Land Systems General Manager.

The recovery vehicle makes it possible for the Army to recover disabled tanks on the battlefield and tow them to an area where they can be repaired and returned to combat.

"We're proud of making delivery on schedule, of course," Truxell said, "but on-time deliveries are routine for us. What is not routine is the extraordinarily short time between the contract signing and today's rollout."

Land Systems signed a \$1 contract on June 7, 1987, to deliver a demonstrator ARV in May 1988 for extensive U.S. Army tests and evaluation. The ARV will be one of two recovery vehicles the U.S. Government will test.

James W. Thomas, ARV Program Director and Chief Engineer, narrated a demonstration of some of the new

vehicle's performance capabilities, including its ability to move a fixed length boom 270 degrees traverse and 0-70 degrees elevation, and to lift 35 tons.

"We built the ARV ahead of schedule, at our own expense, using virtually the same supplier base for the chassis that we use for the Abrams tank," Thomas said. "This, combined with new commercial suppliers who provided many of the parts at their own expense, non-developmental recovery components, and a work force that is 100 percent dedicated, means we can build the best recovery vehicle the Army can get for its money."

Engineered for combat recovery operations, the ARV features a modified M1A1 chassis and powertrain, 35-ton rotating crane, 70-ton winch, dozer blade, 30mm armor protection, Nuclear Biological Chemical overpressure system, automatic hook-up capability and an automatic fire suppression system.

"We've built a recovery vehicle that offers the Army commonality with the highly successful Abrams tank," said A. William Carion, Vice President and M1A1 Program Director. "It is survivable, fast and mobile and able to tackle the toughest challenges imaginable. Using the same chassis and powertrain as the M1A1, the ARV can keep up with the main battle tanks it was designed to support."

The M1 series tank has repeatedly proven itself in the field, most recently in the 1987 Canadian Army Trophy competition conducted in Europe, where a U.S. Army

(Continued on Page 3)





**Heroes Honored.** Ronald G. Ray Sr., and his wife, Joyce A., received media attention and official recognition for their saving of five small children from a home fire in Wichita, Kan. At left, Ray, a router operator for the Cessna Aircraft Company, is interviewed by a Wichita television news reporter before the Rays and two of their children left for Topeka, the state capital, in a Cessna Conquest propjet. At right, Kansas Gov. Mike Hayden reads from a citation the Rays were awarded by the Kansas State Senate and the governor for their heroism.

Cessna Employee and Wife Save Five Children in Tragic Fire By Dean Humphrey

Five small children are alive today, and Cessna Aircraft employee Ronald G. Ray and his wife, Joyce A., are heroes.

But characteristically, all they can think about when they remember that bitterly cold evening in February is that two little children died in the fire that swept through a home in Wichita, Kan.

Five others would surely have perished if the Rays had not courageously come to their rescue.

Fate placed Ray and his wife at the scene of the tragedy that night. A last-minute decision to pick up some hamburger buns for dinner while driving on their way home led them down an unfamiliar street.

A flickering light in a front room caught Ray's attention. At first, he thought it was just one of those shimmering, decorative lamps that change color.

But something made him stop his pickup truck and take a closer look. What Joyce and he saw shocked them into action: leaping flames, billowing black smoke — and tiny faces in the window of a downstairs bedroom.

Although the wind chill index was 30 below zero, Ray attacked a storm window with his hands and feet while his wife ran to the pickup for a crowbar.

After ripping out the storm window with his hands and then battering and unlocking the inner window with the

crowbar, Ray struggled through the small opening to find five crying children huddled together on a bed.

As the flames intensified and the smoke boiled around them, Ray handed the terrified children, one by one, through the window to his wife below. One baby was seriously burned.

But Ray's ordeal wasn't over. Moments later a dazed teenager, who apparently escaped from another part of the house, told Ray that two more youngsters were inside the burning home.

Back into the inferno he went, only to be driven out, empty-handed, by the choking smoke. Ray was sure that if he could have taken just a few more steps he could have saved the missing children. But firemen later found the youngsters huddled in an upstairs closet, where they had died trying to escape the smoke and flames.

When firemen and paramedics arrived, the Rays stood back and watched as rescuers battled to find the missing children and beat down the raging fire. After reluctantly telling their story to reporters, the Rays continued their drive home.

When Ray arrived the next morning at Cessna's Pawnee plant, where he makes parts for the Caravan as a router operator, he hadn't seen the newspaper or television accounts of the tragedy. But his fellow workers had, and

they were standing in line to shake his hand. Joyce, limping on a knee twisted during the ordeal, was receiving similar treatment from her fellow employees at the Boeing Military Airplane Company in Wichita.

During the days that followed, the Rays were repeatedly interviewed by the media and honored during an appearance before the Wichita City Council.

The most memorable event came a week later when the Rays and two of their children, Jeri Lynn, 18, and Ronald G. Jr., 13, were flown in a Cessna Conquest propjet to Topeka, the state capital. It was the first flight of their lives for Ray and the children. In the State Senate, the Rays were given a standing ovation and certificates of recognition, followed by a private meeting with Kansas Gov. Mike Hayden.

State Senator Eugene Anderson of Wichita eloquently paid tribute to the Rays when he said, "They didn't start out to be heroes. All they wanted to do was get some food from the store to feed their children, and on the way they performed an act of uncommon valor that made them heroes."

Ray humbly put it another way. "Joyce and I just happened to be at the right place at the right time, and we did what we had to do."

Amber Rowden . . .

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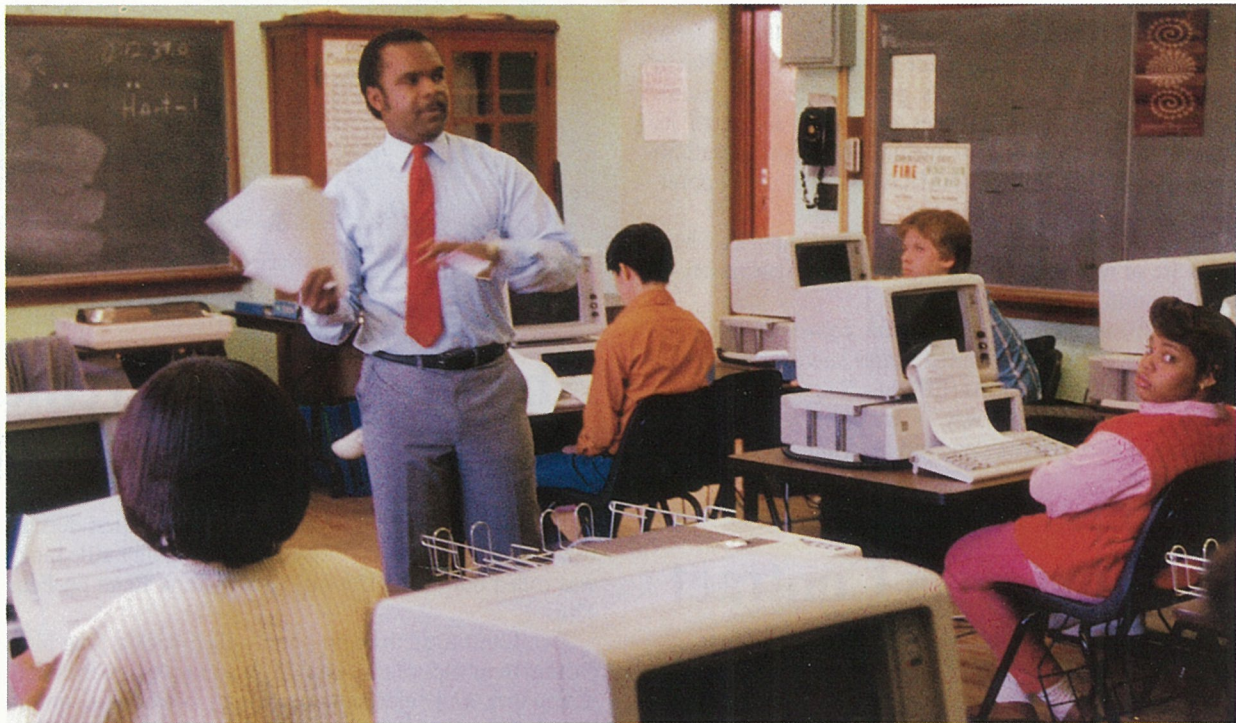
tions employees, who responded by donating more than \$5,000 in two days. The outpouring by employees enabled the facility to donate more than \$10,000.

Neal wrote a letter to the other companies in the Highland Industrial Park to request support for Amber's plight. "This young lady has tugged at all our heartstrings and we are responding," he said in his letter. ". . . I wanted you to be aware of our response to employee requests for this help. I'm sure you're faced with the same employee and personal concern and encourage you to look within your budgetary policies to find ways of helping support this young lady's fight for life."

The letter and the fund-raiser at Camden Operations started a countywide effort to raise the needed money. Camden residents and area businesses held rummage sales, informational roadblocks and even a benefit concert. The effort on behalf of the community spurred the involvement of the entire state.

The day the letter went out, there was less than \$30,000 in Amber's account, which had taken several months to raise, according to Hill. "In less than two weeks, it had gone up to more than \$170,000," he said.

Amber was born with jaundice, which developed into hepatitis and persisted until she contracted cirrhosis. Before she went into the hospital for the transplant, doctors had given her three months to live.



**Aid to Students.** Cornelius Anthony, Senior Programmer Analyst at the Corporate Office, conducts computer training for students at Soldan High School in St. Louis. Anthony holds the sessions once a week as part of the Corporate Office's Partnership Program with the school. The program, begun last year, was developed by Roger A. Krone, Corporate Manager-Acquisitions and Divestitures. A number of Corporate Office employees participate in the program, which provides personnel, instructional materials and funding to improve the school's curriculums in mathematics, science, arts and humanities. Anthony and Kenneth A. Janoski, Programmer Analyst, worked with Soldan officials in organizing the computer classes.

Camden Awarded Contract for Sparrow Guidance and Control Sections

(Continued from Page 1)

of Canada, Egypt, Portugal and Australia. Deliveries are scheduled to begin in April 1989 and continue through March 1990.

In announcing the contract, the Navy said that the Camden Operations has had few production problems and Sparrow system quality control has been excellent. As a result, reliability of the fleet hardware has continually increased.

Camden has produced nearly 5,000 AIM/RIM 7M Sparrow missiles since it began work on the system in 1982. Last year, it completed 1,433 units and received contract orders for an additional 1,391 missiles. The Navy had previously announced that it would phase out Sparrow procurement to be replaced with the Advanced Air-to-Air Missile (AAAM). However, it will not have sufficient AAAMs until Fiscal Year '93 to support mission needs and is expected to continue procurement of Sparrows until the mid-1990s.

The air-to-air AIM-7M is carried on the Navy's F-4 Phantom II, the F-14 Tomcat and the F/A-18 Hornet. The Air Force carries the missile on the F-15 Eagle and has plans to install it on the F-16. The shipboard Seasparrow (RIM-7M) is used for fleet antiship missile defense.

The award marks the second time in as many months Pomona captured a majority award in a second-source competition. In January, the Navy awarded Pomona 61 percent of its 1988 Standard Missile procurement contract.



## Abrams Recovery Vehicle Tows M1A1 Tank in Rollout Ceremony

(Continued from Page 1)

crew using the M1 took first place as "Top Gun" against all other NATO entries.

"The M1A1 Abrams tank has operational readiness rates of approximately 95 percent," Thomas said. "Commonality with the M1A1 ensures a highly reliable armored recovery vehicle with proven components and nondevelopmental equipment — which translates into reduced life cycle costs and certainty that the ARV will be there when you need it."

The ARV hull was built in the Lima Army Tank Plant, Lima, Ohio, on the same production line as the M1A1 Abrams tank; however, the demonstrator vehicle was completed in the Land Systems prototype shop located with its headquarters in Sterling Heights, Mich. The Army will test the vehicle and the other entry during the second half of 1988, and the production contract will be awarded sometime in 1989.

The Army plans to build more than 800 recovery vehicles at a cost of more than \$1 billion. The need for a new recovery vehicle grew out of the inability of the M88A1 to keep up with and provide adequate support for the M1A1 Abrams tank. The M88A1 is the recovery vehicle presently being used by the Army. It is built by BMY of York, Pa., a division of Harsco Corporation, which plans to compete with Land Systems by updating its M88A1.



James W. Thomas (left), ARV Program Director, and Michael Morris, ARV Manager, Check Out Demonstrator ARV

## Company Divisions in San Diego Are Assisting Employees Who Want to End the Smoking Habit

Convair, Space Systems, Electronics and Data Systems divisions in San Diego are lending a helping hand to employees who want to kick the smoking habit.

Through the Convair Recreation Association's Health Fitness Center (HFC), employees and their spouses may enroll in a smoking cessation program called "Live and Breathe." The company pays half of the fee. Employees paying the other half may do so through small payroll deductions.

"Convair is delighted to support this excellent program because we firmly believe that stopping smoking improves the quality of life so much that an inevitable improvement in productivity will result," said George W. Roos, Division Vice President-Human Resources.

The program was initiated during the annual "Great American Smokeout" last fall. Before the first classes began in January, 80 employees had signed up — twice as many as expected — so that two separate classes had to be scheduled.

The classes are led by John D. Frederitz, who modeled this program after the smoking cessation program he developed at Scripps Clinic in San Diego. The program uses a multidisciplinary approach along with strong social

support and a 24-hour "crisis hotline."

"It is generally assumed that smoking cessation is achieved rather quickly and, in some cases, miraculously," Frederitz said. "Almost all people can quit smoking for short periods of time, sometimes up to months. However, the data for most smoking cessation programs show that 70 percent of those who quit will relapse within 90 days."

"Live and Breathe" is a three-pronged program. It defines the reasons for smoking and provides positive reinforcement for quitting, it addresses the life-style changes that support quitting, and it targets relapse by maintaining contact with the employees during the first 100 days following the quitting date.

Group support plays a key role in the program. After the quitting date, employees support each other through a buddy system with telephone calls and encouraging words during the twice-a-week classes.

"If someone is looking for a quit-smoking program, this is a great one," said Edward C. White, Salaried Compensation Administrator at Convair. White, a two-pack-a-day smoker for 34 years — "three packs a day during mid-year salary reviews," he said — formed a support group with two coworkers in the same area.

## Space Systems Cited

Space Systems passed an important milestone recently when Brig. Gen. Gorham B. Stephenson, Controller-Air Force Systems Command Headquarters, visited the division to present the Cost/Schedule Control System Criteria Tri-Service Validation.

The validation is awarded to corporations that have successfully implemented a performance management system according to stringent Department of Defense instructions.

The system reviewed by the Air Force was Space Systems' Integrated Management System as it applies to the Titan/Centaur contract. Space Systems is under contract to Martin Marietta to build 10 Centaur upper stages for the Titan IV, an Air Force program.

## Employees Donate Food

Fort Worth employees donated more than 5,400 pounds of food to the Food Bank of Greater Tarrant County, Texas, in a recent food drive at the division.

Employees placed canned food items in collection barrels at plant gates during the drive.

A number of employees assisted by sorting and delivering the canned goods.

## Herbert N. Rose Couldn't Drive the Baja Run, So He Pedaled It By Jack M. Price

A 60-year-old Land Systems employee recently completed a 1,200-mile bicycle run down Mexico's Baja Peninsula despite eyesight that would keep him from driving the same route in a car.

Herbert N. Rose, a program coordinator at the Detroit Arsenal Tank Plant, is legally blind in his left eye and has only 20/40 vision in his right. His depth and color perception have been lost, and he cannot see in dim light.

"Most of my friends say I'm blind as a bat," Rose said. "But what do they know. Just say 'significant vision loss,' or 'optically impaired.'"

Doesn't optical impairment limit his bike-riding ability?

"It sure doesn't help," Rose said. "But I have more of a problem in stores and restaurants than on the road. Besides, those I ride with are always there to give me a hand if I need it."

Rose said he found out about the Baja run from an article in *General Dynamics World* about a Convair employee, Bob Wagner, who organized the previous 12 desert tours.

After a series of telephone calls and letters, Wagner invited Rose to join the tour with 42 other cyclists. Rose dismantled his bike and packed it in a rented bike bag, flew to San Diego and pedaled 34 miles to Tecate, just north of Tijuana, for the start.

Rose said his Midwest experience had not prepared him for the effort required to drive a bike loaded with 35 pounds of gear and water up a hill for an hour and a half. "Some hills took everything I had," he said. "I felt that if I stopped I would not be able physically or psychologically to start again. I thought someone had misplaced the

Continental Divide."

The downhill was not much relief but only the substitution of one effort for another. The speed of the bikes had to be controlled, but the brakes had to be released, or overheated rims could have caused spectacular accidents. "It seems ludicrous to rest from coasting downhill," Rose said, "but it was not uncommon for riders to get off the bike during descent."

Riders slept in motels with four to seven people to a room. "I was usually so tired I could have shared a bed of rocks with a family of porcupines or curled up on a tree stump," Rose said.

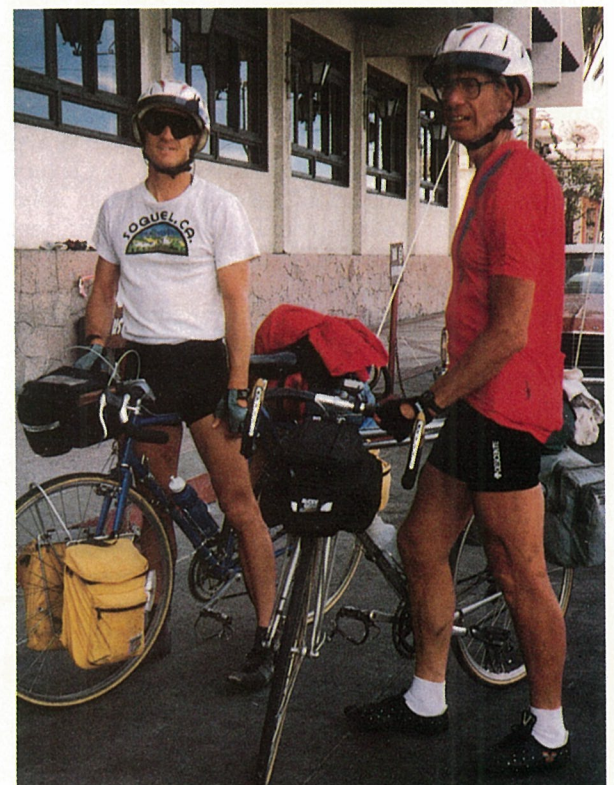
The tour reached Cabo San Lucas, the southernmost point on the Baja, 16 days out of Tecate. Rose and some of the other bikers pedaled 105 miles north to LaPaz for a total journey of 1,209 miles.

Rose said he made the trip because it sounded different and exciting and he certainly would do it again. "The circle of my friends has been widened, the number of challenges met has increased and my experiences enriched because of my exposure to a group known as Baja 13," he said.

Rose started his interest in biking in 1981 with a five-mile test drive offered by the shop selling the bike. Within a week he was doing about 100 miles, and since 1982 he has averaged more than 5,000 miles a year.

During the off-season, Rose keeps in shape with a daily regimen that includes 120 push-ups and 215 sit-ups.

Rose said he was "only" 59 when he took the Baja tour. "I guess now you can call me an old man," he said.



Intrepid Cyclists. Herbert N. Rose of Land Systems (right) and Joseph Sweeney, a physical fitness instructor, celebrate the end of their bicycle tour of the Baja Run at La Paz, Mexico.



## Television Surveillance System Is the Key to Security at Fort Worth By Joe Stout

There are many sights to see on the two dozen television monitors that face controller-dispatchers working in the new Security Guard Control Center at Fort Worth's main plant.

Traffic on nearby Bomber Road and at the plant's main gate and activities on the shore of Lake Worth, where it bounds the 602-acre facility's north edge, are among live images presented on the center's screens.

The television surveillance network is just one aspect of a high-technology physical security system that recently went on-line at the division. The televisions are coupled with scanning cameras that can be remotely controlled by the center operators, and each camera has low-light, high-resolution zoom capability that can clearly show such details as the license plate numbers of passing cars.

The operators also monitor light panels linking them to alarms in nearly 200 special access areas of the plant. Operators control entrance and exit locks at 12 video gates.

The various elements of the system are united on master control panels at three operator stations in the center. The operators can switch images among screens and can videotape selected images while performing their other tasks of answering control center telephones and dispatching guard patrols. The master control panels are equipped with headphones and foot switches for hands-free operation.

In addition, the center's phone network incorporates features that allow virtually unlimited call-patching among various offsite locations and emergency service sites.

The system reflects the state of the art in electronic security equipment, including flexibility for expansion and future advances, said Steve R. Noakes, Guard Chief at the division.

"We're already updating the system, and we'll continue to do that in the future," Noakes said. "Security technology is changing quickly, and our goal is to keep up with it."

The system is the latest improvement to result from a physical security survey that was conducted at Fort Worth a few years ago. "One of the things we did (based on the survey) was set up a 24-hour-a-day fence patrol around the perimeter of the property," Noakes said. "As a supplement to our patrols, the surveillance cameras increase our ability to ensure plant security along the miles of perimeter



**High Tech Security Center.** Fort Worth Security Guards Henry L. Smith, Joe E. Bogaski, Rachel M. Martin and Frank P. Murray (left to right) operate consoles in Fort Worth's updated Security Guard Control Center. The center integrates new technologies to achieve improved plant surveillance and protection.

fences."

Features and capabilities of the system have also changed the work environment in the control room, increasing efficiency there, he said. "The overall noise level in the control center has been greatly reduced," Noakes said. "The new system was designed with human factors in mind, because the control center is normally a busy place with a certain potential for job stress."

The system's alarm panels are partially automated, and further automation is being considered. The alarms are activated anytime someone enters or exits the various

secure, closed areas of the plant.

Persons authorized to enter the areas call the control center before gaining access. Computer technology can be used to further streamline the operators' task of logging each entry and exit, Noakes explained.

The new system brings many tangible and intangible benefits to Fort Worth's security operations, Noakes said. "One intangible benefit is the psychological deterrence provided by the presence of remote cameras around the perimeters of the property," he said. "It is one more factor that adds up to a high level of security for the facility."

## Valley Systems-Produced Multimedia Presentation Widely Viewed By Jerry Littman

What do William Griscom and Alexander Graham Bell and his assistant, Thomas Watson, have in common?

Thousands of General Dynamics employees who have seen the Valley Systems Division-produced multimedia presentation, "A Century of Pride," probably know the answer.

The 33-minute program explains that these men, in separate ways, played roles in development of what is known today as General Dynamics.

"A Century of Pride" was made for showing at state-of-division meetings for Valley Systems and Pomona.

The multimedia presentation has been viewed by more than 20,000 General Dynamics employees and their families at Valley Systems; Pomona, including facilities in Camden, Ark., and Window Rock, Ariz.; Fort Worth; Electric Boat; Space Systems; Electronics; Convair; Land Systems; and at a corporate review in Palm Springs, Calif.

The presentation contains 589 slides and eight minutes of film, using 13 slide projectors and two motion picture projectors. It can be shown on screens as wide as 30 feet.

Kevin J. Cryan, Supervisor-Film and Television Group at Valley Systems, supervised the making of "A Century of Pride." Clinton Comerford, Lawrence De Paula, John Machas, William Mitchell and Theodore Williams were responsible for the research, writing, photography, music and programming of the show.

The Film and Television Group received support from the Valley Systems Publications Department, and many divisions provided information that is used in the presentation.

"A Century of Pride" notes that General Dynamics began with William Griscom, who in 1881 had patented a fist-sized electric motor and then created Electro Dynamic. Griscom was killed in a hunting accident and Electro Dynamic was merged with the Holland Torpedo Boat

Company to form what is now the Electric Boat Division.

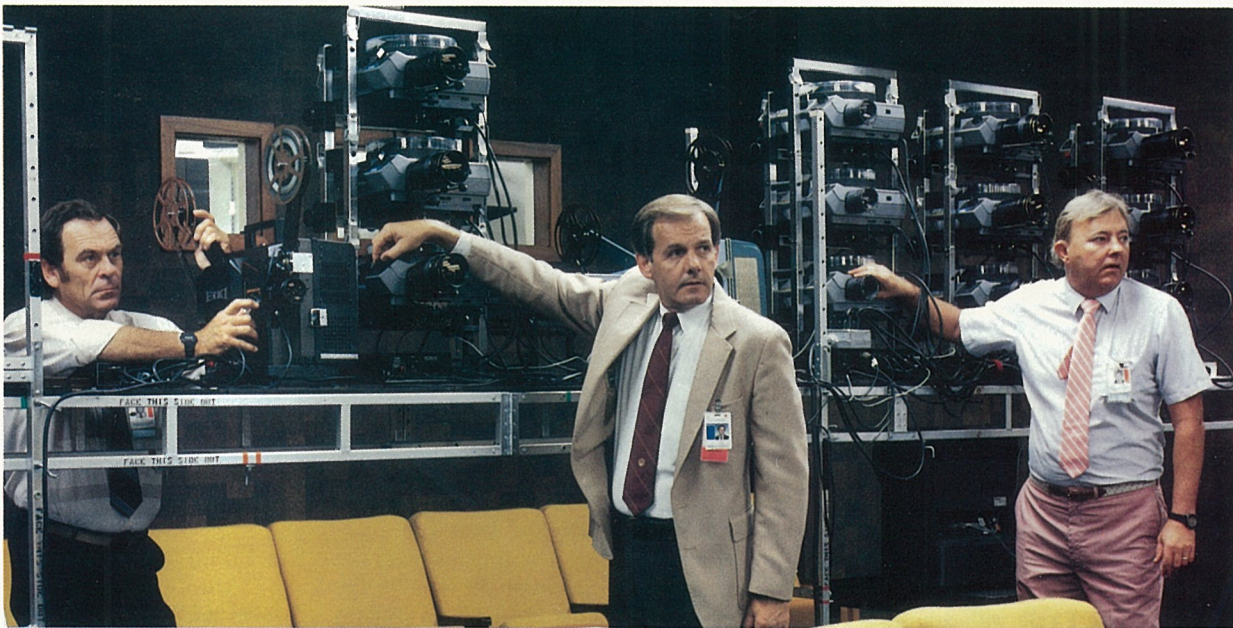
Meanwhile, Thomas Watson founded the Fore River Engine Company, the cornerstone of the Quincy Shipbuilding Company. And, when Alexander Graham Bell's patents had lapsed, many companies plugged into the telephone business. One of these companies was Stromberg-Carlson, which was at one time a subsidiary of General Dynamics.

The presentation reviews the company's history from these early beginnings to the present and closes with these

remarks:

"Those who were instrumental in the early development of General Dynamics also had much to do in shaping the destiny of the country. Today, we still have the men and women with these same qualities to carry on this great tradition.

"And now, we are entering a second century with the same confidence that has always been the hallmark of this company. General Dynamics, the company of the past 100 years and that of the next 100 years."



**Multimedia Program Presented.** The Valley Systems Division-produced multimedia program, "A Century of Pride," has been seen by more than 20,000 General Dynamics employees and their families throughout the country. Preparing the presentation at Fort Worth are Don C. Phillips (left) and William Mitchell (right), both Valley Systems visual media technical specialists. Assisting them is Robert F. Olmstead, Senior Administrative Services Analyst at Fort Worth.

## Six Valley Systems Employees Receive Eagle Awards for Outstanding Work Performance

Six Valley Systems Division employees have received the Eagle Award for Excellence given annually for outstanding job performance and sustained contributions to the company.

Recipients of the award are: Mary D. Ankeney, Product Line Manager, Excellence in Production Management; John L. Baird, Acting Director-Administrative Services,

Excellence in Management; Rebecca Rhoads, Engineering Specialist, Excellence in Productivity; Marion E. (Bud) Van Zee, Engineering Staff Specialist, Excellence in Engineering; Warren O. Wilderson, Engineering Staff Specialist-Electro-Optical Guidance Design, Excellence in Engineering/Production Transition; and Jim R. Womack Jr., Manager of Production Support-RAM, Excellence in

Production Support.

The Eagle Awards were established to recognize superior achievement and contribution in all phases of the division's activities and are based on the recommendations of division vice presidents and directors. The final selection is made by the division general manager.



**Companywide Employee Survey Reports** Compiled by Sue L. Shike

# Important Steps Taken in Many Areas To Improve Company's Communications

Intensified efforts to inform and respond to the media, a nationwide advertising campaign, the organization of contributions and community affairs staffs, frequent briefings by management and the creation of newsletters. . . These are some of the collective efforts under way to improve communications at General Dynamics.

Less than half of the employees responding to the survey in 1986 rated General Dynamics' public relations as good. "I arrived here at the same time as the employee survey was under way," said Robert A. Morris, Corporate Vice President-Communications. "That was important because I could take the views of the

employees under consideration as we structured our communications programs."

The formation of those programs included key personnel appointments. Morris is the company's first Corporate-level Communications Vice President. Four persons were named Corporate Directors, Peter K. Connolly for Public Affairs, Chuck N. DeMund for Advertising and Promotion, Winston C. Gifford for Contributions and William B. Pedace for Community Relations. In addition, the Communications Department started programs in four areas: media relations, advertising, internal communications, and contributions and community relations.

## Company Tells Story by Responding to Media

On any given day, Public Affairs personnel receive some 50 to 75 media inquiries at the company's 15 operating units. Depending on the news value of a topic, that number often increases dramatically.

A timely and sincere effort is made to respond as completely and accurately as possible to each individual inquiry. These include not only telephone and written contacts from the daily and trade press here and overseas, but from radio and television stations, newswires and a range of free-lance journalists. Company policy instituted by Chairman and Chief Executive Officer Stanley C. Pace in 1986 dictates that each will receive full and equal attention and that none will receive a "no comment."

The benefit of this openness is that the company's

points of view are given to the press and are often publicized.

Another strategy to effectively present the company's story is to make top executives available to the media. This strategy includes taking the initiative and organizing meetings between executives and editorial groups. The Communications Department has set up numerous conferences between Pace and editorial boards at key publications throughout the country. The divisions and subsidiaries are also making their high-level executives available to the media on a "for the record" or "background" basis.

These efforts to improve media relations have recently resulted in a number of very positive stories about the company at the national level.

## Ad Campaign, PBS Series Help Image

The Communications Department has enhanced the company's image by sponsoring educational television programming and organizing and executing the company's first nationwide advertising campaign in more than 25 years.

Over the last 18 months, the company sponsored a series of leadership specials for public television about Winston Churchill, Dwight Eisenhower, Lyndon Johnson and Pope John XXIII. Videotapes of each show, accompanied by study guides, were distributed by the company to 25,500 schools across the nation.

Following a competitive agency search, the Communications Department selected Wyse Advertising of Cleveland to conceive an advertising campaign. The agency designed a series of print ads that began appearing in August. Television commercials debuted in February during the Winter Olympics and Cable News Network's coverage of the Iowa presidential primary.

Television advertising will continue during CNN's 1988 campaign coverage and, beginning in the third quarter of the year, on ABC's "This Week With David Brinkley." Print ads will also appear.

## Community Relations, Contributions Improved

The company is committed to being a good corporate citizen in the community, the nation and the world. In line with that commitment, the Communications Department formed its first professional full-time corporate staffs to organize and execute programs in contributions and community relations.

Requests from charitable organizations for donations from the Corporate Office alone averaged 325 per month during 1987. A committee of corporate vice presidents was organized to review and approve contributions, and the contributions staff developed a format for a specific contributions operating plan.

The community relations and contributions staffs are also working with their counterparts at the divisions and subsidiaries, all of whom have their own programs. At Electric Boat, for example, the March of Dimes

Walk America fund-raiser generated such large numbers of participants that teams were organized and the company provided T-shirts for them. Electric Boat also targeted its Matching Gift program, which had traditionally benefited educational institutions, by encouraging employees to donate to nonprofit organizations. At Pomona, the division is revamping its program to better meet community needs.

These community activities will be highlighted in a brochure that will be similar to one about Quonset Point published last year.

In addition, the corporate staffs are setting up Corporate Policies and Procedures to define guidelines for contributions, community relations and employee volunteerism.

## Newsletters, Briefings Inform Employees

Efforts are under way throughout the company to maintain continuing, regular and candid communications with employees.

New employee publications are appearing and many existing newsletters are expanding. New publications include EB Tide at Electric Boat, GDFW This Week at Fort Worth, Valley News and Views at Valley Systems and FYI at the Corporate Office. A general interest brochure about the company is being prepared that can be used in customer briefings and community activities.

*General Dynamics World* has gone to full color on a regular basis and some recent issues have increased from eight pages to 10 or 12.

Pomona expanded its newsletter, Spectrum, with a quarterly pullout calendar and, for the fifth year, pub-

lished an annual report for employees. Valley Systems also distributes an employee annual report and has published several issues of "Feedback," a newsletter dedicated to survey activities. A daily news summary is prepared by the Washington Office and distributed throughout the company on the Electronic Mail and Office System. The Washington Office also recently began a Weekly News Review for all divisions and subsidiaries.

Employee meetings with top executives represent another internal communications initiative. Pace has conducted question-and-answer sessions with all Corporate Office employees. Several division general managers hold periodic breakfasts or dinners with small groups of randomly selected employees.

# Dianne Coutoumanos Is Honored for Helping A Choking Coworker



**Recognition for Rescue.** Danny L. Reed, Fort Worth's Director of Manufacturing Development, presents commendation plaque to Dianne E. Coutoumanos, who assisted a coworker who was choking.

Dianne E. Coutoumanos, a clerk in Fort Worth's Manufacturing Development Department, was honored recently for her quick action in performing lifesaving procedures on a fellow employee who was choking on food.

Coutoumanos used the Heimlich maneuver to rescue Rose Marie Carl, who choked on a bite of apple as the two ate lunch together in their work area.

Coutoumanos said she learned the Heimlich maneuver and other lifesaving procedures in Red Cross-sanctioned courses.

In a commendation letter to Coutoumanos, Charles A. Anderson, Vice President and Fort Worth General Manager, wrote the following:

"You recognized a potentially life-threatening situation and quickly and instinctively moved to help. There is, of course, no way to know whether your quick action might have actually saved a life, and this recognition is not based on that presumption. It is your concern and your willingness to become involved at the moment of emergency that is the motivation of this commendation."

Charles N. White, Fort Worth Vice President - Production, added: "You faced a frightening moment without warning, and you responded with courage and intelligence. We are proud of you, we salute you and we thank you." The letter also noted that Coutoumanos' action is a fine example for other employees to follow in recognizing and acting on their responsibilities to others.

Over the years, General Dynamics employees have acted many times to assist each other in a variety of medical emergencies, according to Bob L. Matthews, Chief Physicians Assistant in Fort Worth's Medical Department.

### Savings and Stock Investment Plans

	Annual Rate of Return for the 12 Month Period Ending:		
	Jan. 1986	Jan. 1987	Jan. 1988
<b>Salaried</b>			
Government Bonds	14.1%	10.6%	6.6%
Diversified Portfolio	28.4%	35.5%	(3.7)%
Fixed Income	12.3%	11.8%	11.5%
<b>Hourly</b>			
Government Bonds	14.2%	10.2%	6.7%
Diversified Portfolio	28.2%	36.9%	(3.8)%
Fixed Income	12.4%	11.6%	11.5%
<b>GD Stock Closing Price</b>	\$70.00	\$74.00	\$52.25
( ) Negative number			

### GENERAL DYNAMICS

# World

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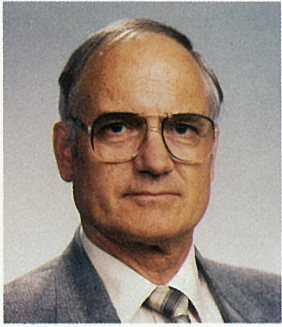
Manager of Internal Communication: Edward D. Williams

Contributors: Julie Andrews, Dick Boudreau, Larry Elwell, Graham Gavert, Jim Gilkerson, Don Gilleland, Dean Humphrey, Jack Isabel, Dave Lange, Jerry Littman, Jack Price, Tom Rule, Chris Schildz, Joe Stout, Joe Thornton



## Simon Verrypp Cited For His Contributions To Minority Business

Simon Verrypp, Senior Buyer at Electronics Division, has been named Corporate Buyer of the Year for his outstanding contributions to the Minority Business Effort (MBE) program.



Verrypp awarded more than \$500,000 of business in 1986 to MBE suppliers for the manufacture of highly complex double and multi-layer printed circuit boards to precise specifications and military requirements. The award recognized his commitment to developing new MBE sources by educating them in how to do business with Electronics. This includes understanding the request for quotation, government specifications, engineering data bases, quality standards and schedule requirements.

By working with MBE sources, Verrypp helped increase total printed circuit board awards to MBE suppliers last year from \$300,000 to more than \$500,000. In one case, Verrypp helped move an MBE supplier through the development phase of circuit cards for the M1 tank multiyear program into the full production phase.

General Dynamics is committed to award contracts to MBE suppliers. In May, Electronics will hold its seventh annual MBE procurement conference, which is a primary means of identifying prospective suppliers.

## Veronica W. Byrd, Fort Worth Nurse, Is Mrs. Black Texas

Veronica W. Byrd, a staff nurse in Fort Worth's plant hospital, was recently crowned Mrs. Black Texas and Mrs. Hospitality in a pageant held in Tyler, Tex.

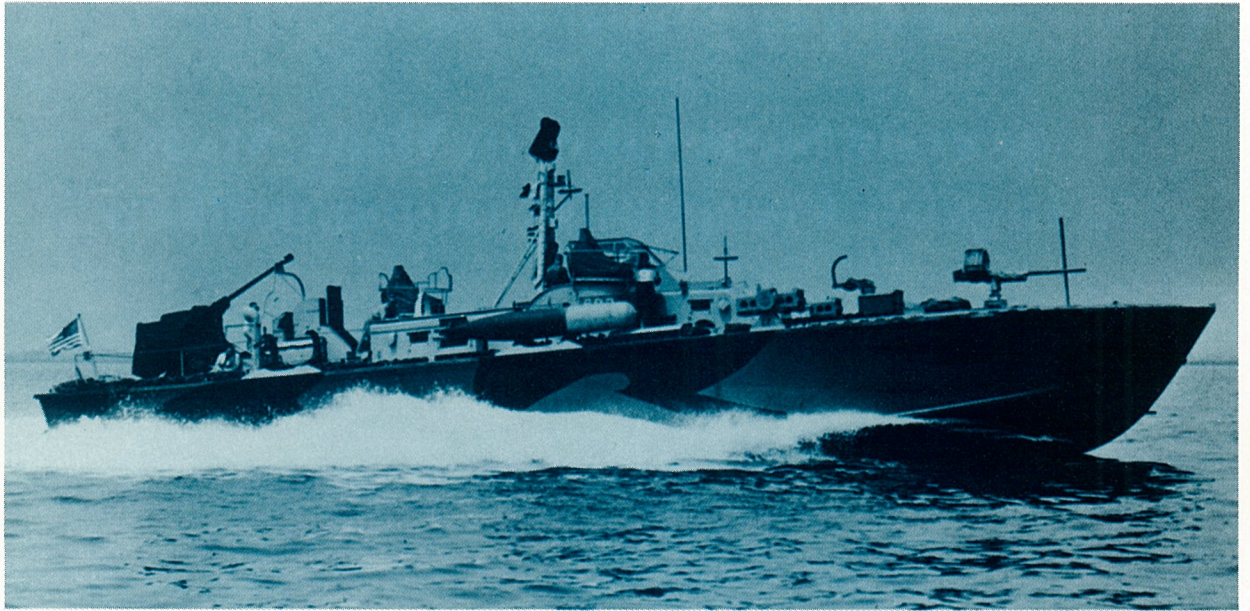


Byrd will coordinate the first official "Mrs. Black Fort Worth" and "Ms. Teen Black Fort Worth" pageants this summer. She will also work with senior citizens and young people.

She is a registered nurse and graduate of Texas Woman's University. Byrd is a member of the Occupational Health Nurses Association, and she formerly served as publicity chairman for the Negro Business and Professional Women's Club and as a board member of the Fort Worth YMCA.



**Bit Player.** Frederick A. Todd, a lead machinist at Convair, selects a 6-inch bit for mounting on a computer-controlled five-axis milling machine. These large cutting heads machine metal parts to tolerances less than the width of a human hair for use in missiles and aircraft.



PT Boats Were the U.S. Navy's Fastest Ocean-Going Craft of World War II

### GD Flashback

## PT Boats Were WW II Speed Champs

By Chris R. Schildz

*"The Navy's new mosquito boats, Tricky swerving reckless craft; Seventy feet of streaking fury, Bow up, streamlined as a porpoise; Hurling through a crust of sea . . ." — M.S.B. (1944)*

They were the fastest ocean-going boats in the Navy, and they inspired many nicknames, including fleetest of the fleet, the expendables and the mosquito boats. They enabled Gen. Douglas MacArthur to make a daring escape from the Japanese siege at Corregidor and they played a role in the legend of John F. Kennedy.

They were the motor patrol torpedo boats of World War II, more commonly known as "PT" boats. More of these lethal wooden speedsters were designed and built by the Elco Division of Electric Boat than by any other defense contractor in the United States.

Perhaps no other vessel captured the popular attention of the American public as the PT did during World War II. Reader's Digest and Life Magazine portrayed the boats as noble little "Davids" going up against Japanese "Goliath" battleships, cruisers, tankers and submarines, an image forged with some truth and some fiction.

The press started its love affair with the PT when General MacArthur made his escape from the besieged island of Corregidor. On March 11, 1942, four PT boats spirited General MacArthur, the general's wife and son, his staff and selected officers out of Corregidor, an Allied fortification in the Philippines about to fall to the Japanese.

In a series of island-to-island night dashes through enemy-held seas, the plywood convoy carried the escaping entourage to the southernmost Philippine island of Mindanao, where the generals and admirals caught a B-17 to Australia. A journalist named William White wrote about the escape along with some other daring PT episodes in "They Were Expendable," a book that gave a desperate America some good news from the Pacific, where the Japanese were scoring success after success.

While White might have overstated some of these exploits, it was clear that pound-for-pound, the Elco PT was one of the most heavily armed vessels afloat. However, PT commanders did not regularly or brazenly attack Japanese ships in broad daylight. They practiced their art at night, in the fog, or behind a smoke screen. They more often sank Japanese troop transports than destroyers, rescued downed pilots, carried commandos on hit-and-run missions, performed reconnaissance and generally confounded Japanese ship movements with their aggressive tactics and maneuvers. And while they didn't receive as much attention, PTs also operated in the Mediterranean and the English Channel, where they were valuable assets in stopping or harassing Axis shipping.

The idea of using small, fast boats as armed naval vessels was established in the early 1900s. England, Italy and Germany had taken an active part in the development of these boats by the beginning of World War I. The damage inflicted by German U-boats later in the war forced the British to investigate the idea of building a fast, powerful, well-armed boat able to withstand North Sea operations yet small enough to be carried on a transport's deck.

Henry R. Sutphen, head of Electric Boat at the time, believed his company had the design experience to provide the British with exactly what they needed. The Elco Division had built motor launches of many varieties, including 54 36-foot electric launches for the World's Fair in Chicago in 1893. Sutphen put his chief designer, Irwin Chase, to work on the project. The British liked the design and made an initial order for 50 boats, called Motor Launches or MLs (sub chasers), and later ordered another 550 to meet the German underwater threat.

While the U.S. Navy eventually acquired some of these forerunners of the PT boats at the end of World War I, it didn't begin to fully appreciate the applications of the modern motor torpedo boat until the years just prior to World War II.

On July 24th, 1941, four and one-half months before America declared war on Japan, the Navy held the "Plywood Derby," a test run of experimental PTs in the open Atlantic off Long Island, N.Y. According to Bern Keating in his book, "Mosquito Fleet": "Two PTs of the Elco design finished with the best average speeds — 39.72 and 37.01 knots . . . Over a measured mile, the Elcos did 45.3 knots with a light load and 44.1 knots with a heavy load.

"On a second Plywood Derby, the Elcos raced against the destroyer *Wilkes*. Seas were running eight feet high — in one stretch the destroyer's skipper reported 15-foot waves, and the little cockle shells took a terrible beating. . . The destroyer won the race, but the Navy board had been impressed by the seaworthiness of the tough little boats, and the Navy decided to go ahead with a torpedo boat program. The board (eventually) standardized on the 80-foot Elco and the 78-foot Higgins (Higgins Industries of New Orleans) designs. . ."

At peak production, Elco turned out a PT boat every 60 hours at its Bayonne, N.J., plant. Of the 772 PT-style boats built in the United States, 398 were produced by Elco. The Elco design took advantage of the most modern construction techniques to maximize quantities built. These production techniques were rigidly standardized and the resulting interchangeability of PT components made it possible to assemble a number of boats on the West Coast.

Another Elco technique was to frame and plank the wooden hulls "bottom up." This unique method of hull construction saved many labor hours. The hulls were then turned over to install the engines, cabin, superstructure and equipment, including radar.

The resulting product was always more than the sum of its parts, but it was the three aviation-type engines that gave the PT its special character as a naval sprinter. Three Packard V-12 engines produced 4,500-shaft horsepower and could drive the boats, under ideal conditions, as fast as 45 knots. The Packards supplied enough power to lift a PT's bow out of the water.

The workhorse engines helped the boats compensate for the rugged combat conditions and the tropical environment. According to Keating, "the PT was usually overloaded, was often running on jury-rigged repairs and spare parts held together with adhesive tape and ingenuity. In tropic waters the hull was soon sporting a long green beard of water plants that could cut the PT's speed in half. Many of the PTs . . . were doing well to hit 29 or 27 knots."

The standard PT crew had three officers and 14 men, but this varied widely in combat. The boat carried enough provisions for five days. A PT originally carried four torpedoes and tubes on the sides of the deck, and two 50-cal. twin machine-gun mounts. By the war's end, all boats had added some combination of 40mm. autocannon, rocket launchers, mine racks, depth charges and 60mm. mortars. Many dropped the torpedo tubes to make these accommodations.

Of the PTs built by Elco and Higgins Industries, 48 were destroyed in combat while another 21 were lost for a variety of other reasons. Allied forces often shot at PTs by mistake, and some were sunk as a result. Kennedy's PT-109, rammed into splinters by the Japanese destroyer *Amagiri*, was one of only two PTs to meet such a demise. But young Kennedy's swimming heroics helped save crew members and the story of PT-109 became part of Kennedy's charisma in his ascendancy to the White House.



## All USAF Pilots at Fort Worth Plant Pass the 1,000-Hour Mark in F-16

Lt. Col. Paul Tradelius, Chief of Flight Operations in the Air Force Plant Representative Office (AFPRO) at Fort Worth, recently made 1,000-hour F-16 experience unanimous for the division's AFPRO pilots.

When Colonel Tradelius logged his 1,000th F-16 flight hour, the AFPRO became something rare among flying units — one where all pilots sport 1,000-hour Fighting Falcon patches on the left shoulders of their flight suits.

The AFPRO only has five pilots, but the achievement is still unusual, Colonel Tradelius said.

The pilots normally log between 200 and 250 hours each per year in checking out new airplanes, testing modified airplanes and delivering F-16s to using commands around the world, he said. A pilot's assignment at an AFPRO site such as Fort Worth usually lasts about three years.

"Even with the maturity of the F-16 program, this is an unusual circumstance," Colonel Tradelius said. "It usually doesn't happen because of normal pilot turnover."

The other pilots in the unit are Maj. Jim Davies, who has more than 1,600 F-16 hours, Capt. Gregg Hammer, with more than 1,300, Capt. Bob Newton, with more than 1,300, and Capt. Vince Amato, with more than 1,200.

All five of the pilots have operational F-16 experience in addition to their service with the AFPRO. Among them, they have served at bases in the United States, Europe and Asia.

The AFPRO pilots fly acceptance tests of F-16s built for foreign air forces as well as for the USAF. In addition



**1,000-Hour F-16 Pilots.** Each of the Air Force pilots in Fort Worth's AFPRO has accumulated more than 1,000 flight hours in the Fighting Falcon. Shown left to right are Lt. Col. Paul Tradelius, Maj. Jim Davies, Capt. Gregg Hammer, Capt. Bob Newton and Capt. Vince Amato.

to flying, they develop operational test procedures and have various administrative responsibilities, Captain Hammer said.

Fort Worth also has several General Dynamics pilots who fly test and acceptance flights for the company.

## Tank Builders Get First-Hand Report on M1A1 at Fort Knox

By Donald L. Gilleland

Land Systems employees learned what soldiers think about the M1A1 Abrams tank when the division recently sent six hourly workers to Fort Knox, Ky.

"After spending an entire day meeting with tank crews and listening to soldiers tell how they feel about the Abrams, our workers came back with a better understanding of how the customer views our tanks," said Edward (Gary) Urbanczyk, MI Deputy Program Manager, Manufacturing, who arranged the trip.

This would normally have been a routine onsite contractor visit, but it turned into a precedent-setting experience as hourly workers — employees who actually build and inspect the tanks that roll off production lines in Warren, Mich., and Lima, Ohio — represented the division in a customer relations visit to the field for the first time.

The trip resulted from discussions between Galdino (Dino) Salvador, Manager of the Lima Army Tank Plant, and Maj. Gen. William Flynn, Commanding General of the U.S. Army Tank-Automotive Command. Each said he thought it would be a good idea for plant workers and their Army counterparts to meet informally and discuss the tank program.

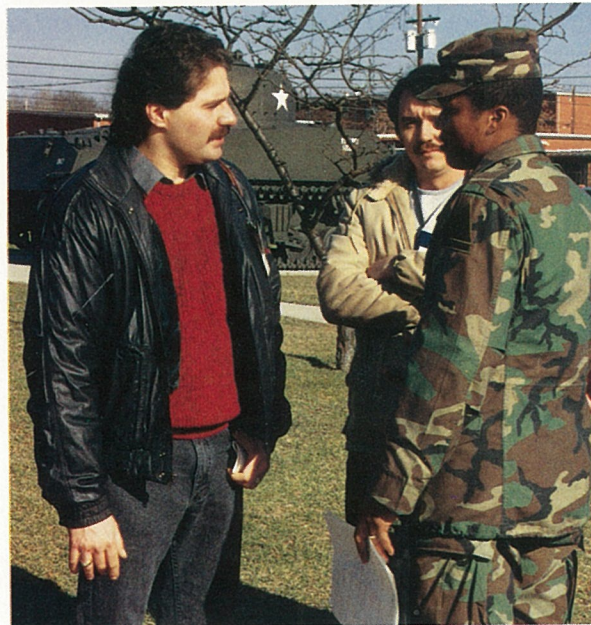
"The visit succeeded beyond our wildest expectations," said Robert F. Schwalm, Vice President-Manufacturing. "The employees were skeptical at first, but, after meeting with soldiers from two battalions, they discovered this was a real opportunity to learn firsthand how the user community feels about the tanks we build."

The group consisted of Michael Burchett, Repairer-Tank-Final, and Dennis Ryan, Inspector, Instrumentation/Functional Test, from the Lima Army Tank Plant in Lima, Ohio; Robert Brown, Repairer-Tank-Final, and Thomas Guzek, Inspector, Floor and Process, from the Detroit Arsenal Tank Plant, Warren, Mich.; and Joseph Clark, Optical Instrumentation Assembly Adjuster, and Matthew Walters, General Inspector, Floor and Process, from Sterling GPS Assembly, Sterling Heights, Mich. All were nominated by local management officials as outstanding performers in manufacturing or quality functions.

With a population of approximately 40,000, including military and civilian employees, Fort Knox is the U.S. Army Training and Doctrine Command's largest site for mechanized warfare training. It was the ideal place for tank builders to talk with tank users.

The group was met at Fort Knox by Bill Fitzgerald, Division Logistics Site Supervisor, and Dan Casto, Systems Engineer. Their first stop was the Armor Center, where Jack Eubanks, Director of Protocol, explained how the Center provides administrative and logistical support to tenant units and satellite activities, including Reserve, National Guard and ROTC units.

From there they moved to a roundtable discussion with



**Employees Visit Fort Knox.** Thomas Guzek (left), from the Detroit Arsenal Tank Plant, talks with Army Sgt. Linsey Coleman at the Armor Center at Fort Knox, Ky. Listening is Dennis Ryan (center), from the Lima Army Tank Plant.

tank commanders and other members of the 2nd Armored Training Brigade, 1st Squadron, 12th Cavalry, followed by a meeting with members of the 1st Armored Training Brigade, 1st Battalion, 81st Armor. The 1st Battalion was the first unit to train soldiers on the M1 Abrams in 1981. In a 14-week course, it trains soldiers in basic tank-related skills, which include about 150 different tasks.

"I've never been on a military base before, so it was quite an experience for me," Brown said. "I think it's a great idea to listen to the guys in the field. They're the ones who have to be satisfied ultimately."

After visiting with soldiers representing maintenance crews, tank commander instructors, artillery instructors and hull section leaders, the group moved to the Boatwright Maintenance Facility to see a display of various tracked vehicles made for the U.S. Army over the last several decades. At the facility, soldiers can completely tear down and rebuild any of the tracked vehicles. There, the Land Systems employees talked with service mechanics who have worked on M60 and M1 tanks.

"The employees visiting with soldiers is a great program with untold potential," Guzek said. "It was a great learning experience to see how the Army uses the tank and to hear the soldiers' ideas about it."

After discussing a wide range of maintenance topics with the mechanics, the visitors moved on to the Armor School Maintenance Department, where they learned about the Army's program for training mechanics. Some of the components used in training are engines, final drives, electrical subsystems and hydraulic systems. Soldiers learn to troubleshoot things like M1 hull and turret electrical and hydraulic problems.

The final stop on the tour was the Patton Museum, where the visitors saw displays of armored vehicles from the earliest times to present M1 tanks. They also saw the General George S. Patton Exhibit, which includes Patton's uniform, ivory-handled revolvers and his staff car, a 1938 series 75 Cadillac limousine.

## Competing Advanced Tactical Fighter Teams Are Building Prototypes

Competing Advanced Tactical Fighter (ATF) teams have frozen their designs and have begun construction of futuristic aircraft prototypes, according to Col. James A. Fain, Director of the ATF Program in the U.S. Air Force's Aeronautical Systems Division.

Fort Worth is coordinating the General Dynamics effort on the Lockheed-General Dynamics-Boeing ATF team. The other team is made up of Northrop and McDonnell Douglas. Lockheed and Northrop are the prime contractors.

"We're doing things differently from traditional aircraft prototype construction," Colonel Fain said. "Instead of bending metal, we're molding advanced composite materials. We'll be flying them in late calendar year 1989 or early 1990."

The ATF is the proposed Air Force air superiority fighter for the 1990s and beyond, destined to succeed the F-15 in that role. It is being developed to meet the ever-increasing threat to U.S. security posed by highly sophisticated and numerically superior Soviet offensive and defensive weapons, Colonel Fain said.

He said the two prime contractors are conducting trade-off studies and developing ground-based and flying prototypes to demonstrate and validate the characteristics of the proposed aircraft designs.

"All the major subsystems are on target, too," Colonel Fain said. "The ground demonstrator engines have been up and running successfully, and the majority of the avionics producers have been selected by the two prime contractors." He noted that all the subcontractors are

adapting readily to the Advanced Avionics Architecture that will be integrated into the new fighter.

With all the systems "tracking well in the demonstration/validation phase," Colonel Fain said he anticipates proceeding on schedule into a "well-defined, full-scale development phase in the 1990-91 time frame."

Each team is to build two versions of its respective ATF prototype. One version will use the Pratt & Whitney prototype engine designated the YF119. The General Electric prototype engine, the YF120, will power the other.

The Lockheed-General Dynamics-Boeing ATF prototype is designated the YF-22A. The other team's aircraft is called the YF-23A.





Norris



Gilmour

## Key Appointments Of Executives Made By Cessna, Convair

Promotions to Vice President have been announced by the Cessna Aircraft Company and Convair.

**Roy H. Norris** has been promoted to Vice President of Citation Marketing at Cessna Aircraft Company. He will be responsible for all Citation business jet sales and marketing activity. Norris has been Director of Citation Sales for the past year. During his six years with Cessna, he has held regional sales manager and division sales manager positions in the Citation marketing organization. He has also held sales management positions with Digital Equipment Corp. and Network Computing Corp. in Charlotte, N.C. Norris is a 1968 graduate of Auburn University, where he received a degree in chemical engineering. He is a licensed pilot.

**L. Roy Gilmour** has been appointed Division Vice President and Program Director-Aircraft Programs at Convair. Gilmour, 49, joined Convair in 1959 and advanced through a number of management assignments. He was named Chief-Facilities Planning in 1971 and Manager-Planning in 1976. In 1978 he was named Director-Planning. He was appointed DC-10/KC-10 Program Director in 1980 and Program Director-Aircraft Programs, his latest position, in 1983. He has also served on several special assignments, including Production Readiness Reviews at the start of F-16 and Phalanx production and the corporatewide review of overhead costs in 1985. Gilmour earned a Bachelor of Science degree in Business Administration at the University of Southern California in 1959.

## Valley Systems Employees Praised by Army For Meeting Stinger-RMP Production Goals

Two U.S. Army generals praised Valley Systems Division employees for their continuing efforts in meeting the increase in the production of Stinger-RMP (Reprogrammable Microprocessor) required by the U.S. Army.

Under the "Meet the Ramp" program, under way at the division, production will increase by 50 rounds per month, reaching 610 rounds per month starting in October. This rate will then remain in effect for the foreseeable future.

(The monthly production increase, when plotted on a graph, presents a steep straight-line "ramp" that Valley Systems employees must "climb" to fulfill contractual obligations.)

Speaking at a recent "all hands" meeting, Maj. Gen. Donald Infante, Commanding General of the U.S. Army Air Defense Center, Fort Bliss, Texas, said Stinger has had a "dramatic impact on the Army and the world . . . because of the quality people who make this quality weapon." He also said that "Stinger will be around for a long time; it has a long life ahead of it."

Brig. Gen. William J. Fiorentino, Program Executive

Officer, Forward Area Air Defense (FAAD), Redstone Arsenal, Ala., also complimented Valley Systems employees for producing a quality product and urged them to "keep the quality high and the costs low."

During the meeting it was announced that the dual detector team, headed by Mary Ankeney, Product Line Manager-Stinger, had been selected to receive the first in a series of monthly awards for outstanding Stinger production performance.

Ankeney accepted a plaque on behalf of the team, and each member received a \$50 U.S. Savings Bond.

The plaque cites the dual detector team and support personnel "for performance excellence in manufacturing Stinger-RMP."

The division has three contracts from the U.S. Army Missile Command (MICOM) that call for production of more than 13,000 Stinger-RMP rounds through September 1989. Division representatives are negotiating with the government for a multiyear contract that will take production of Stinger-RMP through 1991.



**General Speaks at Valley Systems.** Maj. Gen. Donald Infante, Commanding General, U.S. Army Air Defense Center, Fort Bliss, Texas, was the main speaker at the recent Stinger "all hands" meeting at Valley Systems Division. General Infante praised Valley Systems employees for their efforts in production of Stinger-RMP.

## Company Employees Find Teaching Is Rewarding, but Demanding By Joe Stout

About 15 Fort Worth and Data Systems Central Center employees are learning how rewarding — and how demanding — public school teaching can be. The General Dynamics employees are participating in the Fort Worth Independent School District's Adopt-A-School Loan Teacher Project.

The employees serve as loan teachers in Fort Worth high schools. School district officials say the employees' commitment has proven helpful to students and teachers alike as regular teachers often take notes and ask questions along with the class members.

The teacher loan program grew out of the district's need for highly qualified teachers in math and science. In response, the division provided engineers and computer programmers to teach in high schools for one hour every day.

The loan teachers become instructors in physics or computer math classes. They must teach essential elements of these courses, but they can set up the classes as they wish. District officials say this freedom brings a fresh viewpoint to the educational process.

General Dynamics engineer George L. Marchesseau is one of the program participants, teaching physics at Polytechnic High School in Fort Worth. Marchesseau assists regular classroom teacher Julie Lowe, who praised his contribution.

"His presence has been a very positive influence for our students here," Lowe said. "He communicates the necessity for developing good thinking skills and strives to make the course work relevant to the everyday outside world, which is something that elicits a very good response," she said.

Marchesseau also has a good relationship with his stu-

dents. "I like them and they seem to like me, too," he said. He has demonstrated his personal interest in the students by attending such outside activities as school sports events.

Kathy R. Ott, a Central Center Quality Assurance design specialist, teaches computer math at an area school. "Adopt-A-School is a great program," she said. "The students are really enjoying the chance to hear someone from the outside who has practical experience."

Engineer J. Ted Martens teaches physics at O.D. Wyatt High School. "I like working with young people — they keep me guessing," he said. "We have a lot of fun learning things together."

Technical Analyst Teresa L. McPeak recently completed an assignment at Metro High School, an alternative campus for students who have been unsuccessful in the traditional school setting. She said that task presented special challenges and offered special rewards, and she could see that students were benefiting from her efforts.

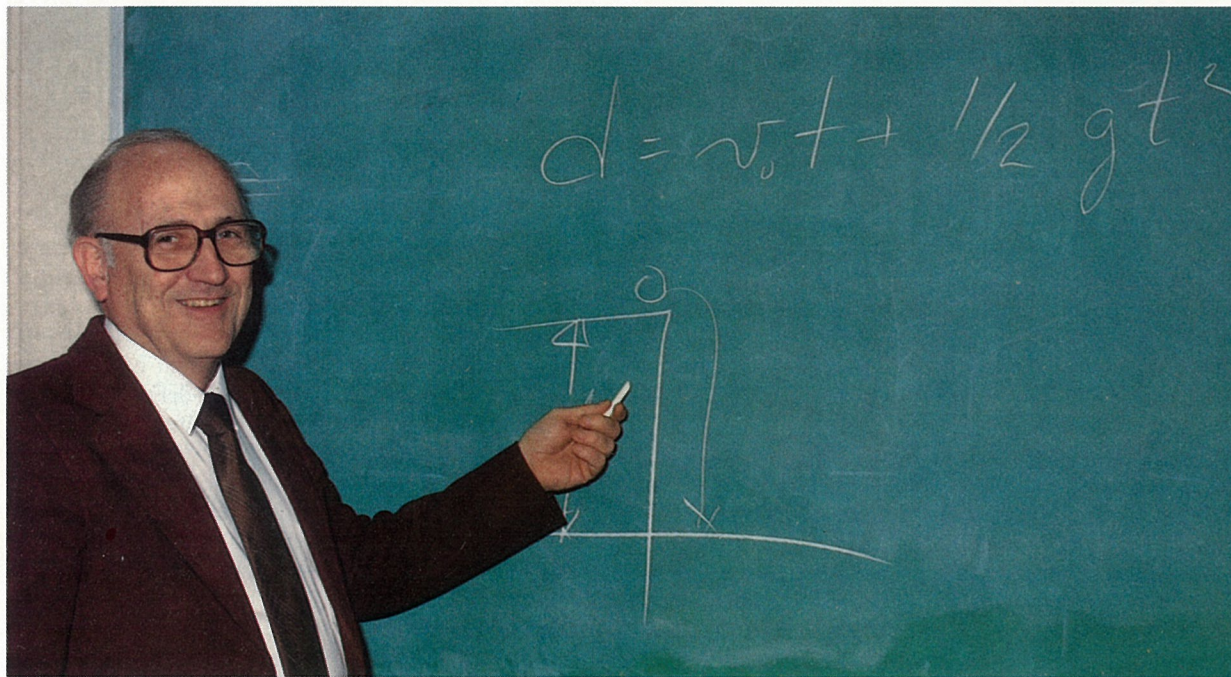
Boyd B. Bushman, an engineering specialist in Special Projects, is teaching at Metro. "We are in the process of designing future jets (at the company), and it is nice to take a look at the people who will be flying them," Bushman said.

"The kids are a pleasure to work with. They're bright and dynamic and have different perspectives," he explained.

Bushman said division management, including Vice President and General Manager Charles A. Anderson, has been extremely supportive of the participating employees' involvement in Adopt-A-School.

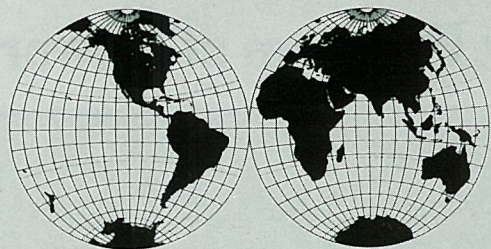
District personnel have not been hesitant about expressing their appreciation for the company's help. Last spring, for example, the division provided a replacement for an Arlington Heights High School physics teacher who was unable to complete the semester. The school's principal, Winnie Taylor, later said that the volunteer's enthusiasm and expertise "changed a potentially negative situation into one that was positive and rewarding for our students."

A few of the loan teachers have previous experience as public school or college-level instructors.



**Fort Worth Engineer George Marchesseau Explains an Equation Used in a High School Physics Class**





## Around the World

**CHQ:** Robert J. Behr was appointed to Corporate Director-Government Accounting . . . Robert W. Knapp joined as DIO Security Manager . . . Amy A. Koller-Carrier transferred from Space Systems and was promoted to Auditor . . . John N. White transferred from Pomona and was promoted to Auditor . . . David C. Nickerson transferred from Convair and was promoted to DIO Senior Engineering Specialist . . . R. Kent Nixon was promoted to Corporate Manager Administration & Planning-Government Relations.

**Fort Worth:** Robert C. Barlow and Maurice B. Johnston Jr. were appointed to Engineering Director . . . Michael P. Baird and Christopher H. Devlin were promoted to Field Service Engineer . . . John A. Baker to Assistant Project Engineer . . . James W. Blackwell to Office Services Supervisor . . . Patsy C. Brunson, Robert L. Connell Jr. and Larry T. Riggs to Logistics Supervisor . . . Jimmy W. Campbell, Georgia A. Powell and Robert D. Powell to Production Specialist . . . Leigh C. Cariker, George E. Wirtz II and Billy H. Wright to Engineering Chief . . . Carol C. Collins to Engineering Administrative Supervisor . . . Paul A. Connolly to Manufacturing Control Supervisor . . . Avery W. Davis to Senior Engineering Change Analyst . . . Vernon L. Denena to Logistics Group Engineer . . . Hibbard W. Forsyth and Richard D. Ward to Project Engineer . . . William P. Fox to Tool Planning Chief . . . Bobby J. Gazzola and Danny Reid to Manufacturing Technology Supervisor . . . Irvin M. Ludwig to Scheduling Specialist . . . Thomas E. Nolen Jr. to Senior Contract Administrator . . . Jerome G. Plake to Electrical/Mechanical Project System Specialist . . . Joe E. Rogers to Engineering Program Manager . . . Frank J. Roy to Engineering Project Manager . . . Terry D. Russell to Project Tool Engineer . . . Kenneth R. Sprinkle to Production Management Specialist . . . Pamala S. Stanfield to Project Manager . . . John B. Stanley to Logistics Group Supervisor . . . Salvatore Tamburrino to Coproduction Management Specialist . . . Benjamin M. Whitaker to Logistics Group Supervisor . . . John M. White to Tooling Supervisor . . . Donnie B. Young to Senior Quality Assurance Field Engineer.

**Electric Boat:** Robert R. Benson was promoted to Engineering Chief . . . Richard E. Finnigan to Test Chief . . . Joseph W. Jaskiewicz to Material Progressing & Control Supervisor . . . Edward Lange to Trade Planning Supervisor . . . Charles J. Schroeder to General Foreman . . . George L. Tourville to Foreman . . . Leonard E. Reed to Small/Disadvantaged Business Administrator . . . Timothy E. Lewis to Purchasing Agent . . . Michael Bruno and Richard J. Schaffhauser to Group Trade Planner . . . At Quonset Point, Janet Byrne to Material Control Supervisor . . . At Kesselring, John E. Gee to Test Supervisor . . . John W. Contos to Foreman . . . Douglas G. Krauss to Radiography Foreman.

**Convair:** Steven L. Allen and Stanley D. Battle were promoted to Program Manager . . . Tom R. Maxwell to Quality Assurance Program Manager . . . John H. Minnich to Product Support Manager . . . Floyd I. Backus Jr. to Engineering Staff Specialist . . . Stephen L. Carpenter to Manufacturing Operations General Supervisor . . . Wayne C. Bohannon, Fred L. Gloyne, Harold R. Horne, Dennis W. Stevens and Sueo Tanabe to Senior Engineering Specialist . . . David K. Bauman and Paul M. Giard Jr. to Administrative Chief . . . Randall D. Lewis and Luigi Palestini to Manufacturing Operations Supervisor . . . Rodolfo A. Sengelmann to Industrial Engineering Operations Supervisor . . . Michael J. Sinnott to Plant Service Operations Supervisor . . . Gail E. Brinkman, Richard S. Crooks, James R. Denzien Sr., Gary J. Haigh, Charles M. Huff, Daniel E. Scherer, John A. Vanderslice III, James C. Virden and Gary L. Webster to Engineering Specialist . . . Karl Taylor to Engineering Chief . . . Robert C. Kennedy to Senior Project Engineer . . . Phillip C. Borja to ILS Engineering Specialist . . . Raymond Richards and Aaron Roberts to Manufacturing Engineering Specialist . . . Richard W. Schauer to Industrial Engineering Specialist . . . Thomas J. Roberts to Cost Development Engineering Specialist . . . William F. Swain to Quality Assurance Engineering Specialist . . . Lorise W. Maynard and Jack C. Waldemar to Procurement Administrator . . . William L. Wilmes to Quality Assurance Project Administrator.

**Space Systems:** Jack C. Randall was promoted to Engineering Manager . . . William E. Ketchum and Michael H. Smith to Senior Proposal Development Specialist . . . William E. Connacher to Senior Technical Publications Specialist . . . Richard W. Jennings, Bernard H. Peyton and Michael C. Simon to Senior Project Engineer . . . Darryl S. Ring and George W. Smith to Senior Engineering Specialist . . . Peter D. Haney to Manufacturing Engineering Specialist . . . Bruce M. Cordell, Gregory R. Jones, Julian Quan and William B. Shepard III to Engineering Specialist . . . Paul Buchy Jr., Danny R. Marshall, Carol Orav and Luis R. Pena to Engineering Chief . . . Peter M. Noyes to Program Engineering Chief . . . Amy J. Koon, Anthony C. Taranto and Larry D. Wadley to Engineering Support Chief . . . Marianne M. Andres to Data Management Supervisor . . . Gayle D. Costanzo to Project Coordinator . . . Dominic De Crescenzo to Configuration and Data Management Chief . . . Samuel H. Packer to Configuration Management Supervisor . . . Forrest R. Seitz II to Quality Assurance Engineering Specialist.

**Electronics:** James C. Petersen was promoted to Technical Publications Manager.

**Land Systems:** Richard E. Proof was promoted to Government Security Manager . . . Daniel P. Adair to Property Administration Chief . . . Terrence J. O'Neill to Contract Negotiator . . . Thomas Chakupurakal to Engineering Program Chief . . . Thomas J. Walkush to Engineering Program Manager . . . Edward G. Urbanczyk to Program Management Chief . . . Judith A. Ferraro to Senior Communications Representative . . . David F. Raker to Senior Financial Analyst.

**Pomona:** Joe H. Hahn and Donald R. Miller were appointed to Quality Assurance Directors . . . Timothy D. Vayhinger to Program Administration Director . . . Arnold B. Alberts, Stewart A. Ernst and Spencer J. Speer were promoted to Quality Assurance Managers . . . Peter J. Meacham and Jack B. Schwedener to Design Specialist . . . David C. Brown to Senior Management Systems Specialist . . . Frank G. Molina Jr. to Program Manager . . . David R. Boersma to Quality Assurance Specialist . . . Faye E. Chapman to Staff Assistant . . . Wolfgang G. Herzog to Material Acquisition Manager . . . Terrence J. Pickrel to Senior Quality Assurance Specialist . . . Richard Geordan to Engineering Specialist . . . Ralph N. Morris to Project Administrator . . . Luis E. Padilla to Project Engineer . . . Ronald E. Pfafflin, Raymond M. Cooper, Jerry D. Homuth, Joseph W. Barber and Dale L. Tidwell to Group Engineer.

**Valley Systems:** Jo Ann G. Durrani was promoted to Compensation Chief . . . Roland C. Gilligan to Publications and Administrative Services Manager . . . Kenneth I. Kemp to Program Manager . . . Robert A. Munoz and Daniel H. Smith to Quality Assurance Chief . . . Kevin R. Waszak to Safety and Health Chief . . . James E. Burke to Group Engineer . . . Malcolm C. Helman to Section Head . . . Gary L. Henshaw Senior Project Engineer . . . David M. Reisman to Skills Training Chief.

**DS:** At Western Center, Paul H. Bernstein was promoted to Project Engineering Chief . . . Thomas A. Clarke to Engineering Software Supervisor . . . Salley E. Morton and Regina D. Veleker to Financial Control Chief . . . At Central Center, Gary W. Keith to Engineering Software Chief . . . John H. Robb and Phillip L. Scheller to Engineering Software Supervisor.

**GDSC:** John O. Barkkari was promoted to Manufacturing Manager . . . Patrick A. Nemes to Quality Assurance Manager . . . Reave L. Ross to Program Requirements Manager . . . Henry A. Umanos to Detroit Operations Contracts Manager . . . Pamela A. Bateman to Domestic Operations Finance Manager . . . E. Steven Jones to Program Personnel Support Services Manager . . . Edward R. Blacke to Fire and Security Services Supervisor . . . Henry W. Patterson to Machine Shop Foreman . . . David R. Phillips to Senior Estimating Specialist . . . Alan D. Ross to Senior Buyer . . . William R. Sandell to Senior Contracts Administrator.

## Fort Worth's Logistics Training Center Gets Major Accreditations



**Center's 10,000th Student.** Logistics Training Center Manager Kenneth L. Miller recently welcomed the center's 10,000th student, 2nd Lt. Rolf Jensen of the Royal Norwegian Air Force. Shown (left to right) are Miller, Lieutenant Jensen and training center instructor Henry M. Juarez.

Fort Worth's Logistics Training Center reached three major milestones recently when it was awarded accreditation by the Southern Association of Colleges and Schools (SACS), was approved by the Texas Education Agency (TEA) as an accredited Texas Proprietary School and enrolled its 10,000th student.

The center is the first of its kind in the aerospace industry to receive accreditation certifying that its courses meet the quality standards of SACS, which is a non-government agency comprising more than 11,000 colleges, universities, occupational institutions and schools. Its accrediting Occupational Commission promotes strong vocational-technical education through the cooperation of business, industry and labor in establishing instructional quality standards.

Accreditation by the TEA also is an industry first because it allows selected courses offered by the Logistics Training Center to be certified for college credit. The TEA links the center with the collegiate system of the Fort Worth-Dallas area as well as the Community College of the U.S. Air Force.

The Logistics Training Center's 10,000th student is 2nd Lt. Rolf Jensen, a maintenance officer in the Royal Norwegian Air Force. He is representative of the many students from allied nations who have received technical training at the center. U.S. Air Force technicians, company technical representatives and General Dynamics Services Company personnel have been among the center's other students.

During its 10-year success story, the center's growth has paralleled the rapid expansion of the F-16 aircraft program, which now includes air forces of 16 nations.



**Space Systems School Aid.** Space Systems, through its National Management Association (NMA) chapter, recently donated four microcomputers and associated software and printers to the science department of Hilltop High School in San Diego. They were presented by Steven K. Saiget, President of the NMA chapter (left), and Dr. Alan M. Lovelace, Vice President and Space Systems General Manager (center), to Principal Dorothy Murphy and Senior Ken Newton (seated). The NMA chapter adopted Hilltop as part of the Partnership in Excellence program with the San Diego County school system.



## Fort Worth's AFTI/F-16 Aircraft in New Program at Edwards AFB

Fort Worth's Advanced Fighter Technology Integration (AFTI)/F-16 aircraft is flying again at Edwards AFB, Calif., in a new program that is evaluating technologies for improved close air support of ground forces.

The first flight in the testing phase was made on Feb. 10th. The evaluation is scheduled to run through April, when the aircraft will be returned to Fort Worth for additional modifications, according to Michael R. Griswold, AFTI/F-16 Chief Engineer at the division. The airplane will resume test flights at Edwards AFB from June to August.

The effort is evaluating technologies for improved communications between ground troops and fighter aircraft crews who provide close air support.

The close air support technology development program is funded by the Department of Defense, according to Capt. Myers N. Drew, the U.S. Air Force's AFTI/F-16 Program Manager. The Air Force is conducting the program with the U.S. Army, which relies heavily on close air support provided by the USAF's Tactical Air Command.

In the event of hostilities, Army forward air controllers would call in aircraft strikes to suppress enemy movement at the forward edge of battle.

The program's goal is to give pilots of future aircraft the capability to fly into the forward edge of battle — or beyond it — and acquire and attack targets successfully on their first pass, Captain Drew said. This will increase chances that the pilot and aircraft will survive, he said.

Fort Worth modified the AFTI/F-16 aircraft for the program, Griswold said. A digital data link was installed to allow communications between the pilot and forward air controllers. Currently, forward air controllers call in air strikes with voice radios that are subject to jamming and misinterpretation.

In addition, the AFTI/F-16's Digital Terrain Management and Display System and its Sandia Inertial Terrain-Aided Navigation (SITAN) computer software were refined. SITAN allows extremely accurate automatic navigation.



Fort Worth's AFTI/F-16 Aircraft on a Test Flight

gation.

Further improvements will be made to the AFTI/F-16's helmet-mounted sight and forward-looking infrared/laser sensor-tracker set.

The program will continue work that was initiated during the previous Automated Maneuvering and Attack System (AMAS) phase of AFTI/F-16 testing to provide a ground collision avoidance system. This system will prevent the aircraft from flying into the ground during high-speed, low-altitude maneuvers.

Plans call for upgrades to the AFTI/F-16 radar and other aircraft sensors to enhance operations over different types of terrain. Some advanced technologies may be tested for adverse-weather or night-attack operations.

Fort Worth is the prime contractor in the AFTI/F-16 program, which has explored how new technologies can be combined to increase the effectiveness of pilots and airplanes. The AFTI/F-16 team received the Air Force Association's Theodore von Karman Award last year for pioneering new technologies in aviation.

## Convair's Amelia Erickson Reaches Her Goal of Corporate Pilot By Julie C. Andrews

"If you want to be a pilot, you must want it badly." That was the message Convair pilot Amelia B. Erickson shared recently with a large group of high school students at a career seminar in San Diego.

Erickson told them it was not easy getting her wings or finding stable employment as a pilot, a career many consider nontraditional for women.

For Erickson, it began when she was 16 years old. Her father, an Air Force pilot during the Korean War, took her

for a ride in a Cessna 150 at Jefferson County Airport near Bloomfield, Colo. "That was the bait that got me hooked," she said.

Four years later, she took her first demonstration ride at the Orange County Airport in California and began flying lessons, gaining her private pilot license in 1977.

"From that point on, my flying career did not exactly soar," Erickson said. "I had spent all my savings just to get my license and had nothing left to keep flying and stay

current. I moved back to Colorado and, like any good aviation fanatic, held two jobs — one of them at the airport, of course."

One of the jobs was in the office at the Jefferson County Airport. To get free flight time, she cleaned snow off airplanes. After becoming a flight attendant for Western Airlines in 1978, she moved to Hawaii and continued flying lessons by starting instrument training. In Hawaii, she met her husband, a U.S. Marine Corps fighter pilot, who would encourage her flying career at every step.

The Ericksons moved to San Diego in 1981. That year she obtained her instrument rating and started aerobatic lessons, a birthday present from her husband.

"After that, all the other ratings were a breeze," Erickson said.

She began flying aviation newspapers from San Diego to six desert airports every month. Next she began flying copilot on charter flights carrying cargo for the Navy to San Clemente Island.

From there she was hired by Wings West in San Luis Obispo as a commuter pilot flying Beech 99s. "After three months of 14 hour days, five days a week commuting from San Diego to San Luis Obispo, I jumped at the chance to fly for Imperial Airlines based in my own backyard of Carlsbad, Calif.," she told the group. Six months later the airline was out of business.

The day after she received her furlough notice from Imperial, she got a letter asking her to interview with General Dynamics.

Erickson is flying turboprop aircraft for Convair Flight Operations. Away from the job, she flies with her husband in their own airplane. One of Erickson's goals is to do more charity flying, like the flights she has made for the San Diego Eye Bank, carrying human eyes to California desert community hospitals for transplanting. She is also Palomar Chapter Chairman of the "99s," a group of women pilots founded by Amelia Earhart.



Convair Pilot Amelia B. Erickson in the Cockpit of a Merlin IV-C

## San Diego Divisions Moving to Implement Corporate Statistical Process Control Plan

General Dynamics divisions in San Diego are moving to implement Statistical Process Control (SPC) in their manufacturing plans. The SPC plan is the product of the corporate SPC working group, which was formed in April 1987 to contribute to productivity and quality improvements.

SPC monitors a manufacturing process by taking various measurements and applying basic statistical charting while a product is being built. SPC warns a process is about to produce a part out of specification. The data

gathered guides decisions about making changes to keep the process in control. "The power in SPC is that it provides an early detection system and can allow manufacturing to cease dependence on mass inspection detection methods," said Paul E. Grant, a Quality Assurance manager at Convair. "We believe it is a major technique for building things right the first time."

The corporate SPC plan calls for an integrated Quality Assurance and Manufacturing program with a team approach in adapting SPC techniques.

Convair pilot projects are beginning to show positive results. In 1987, a pilot project was instituted in the Tomahawk cruise missile tailcone assembly area to determine the sources of variations of dimensions and bring the process under control. The project was initiated by Convair's Operations function and supported by Quality Assurance and Industrial Engineering. The use of SPC controls is expected to maintain nearly defect-free production and to eventually eliminate the need for inspection of this assembly.



# Hotlines Are Essential in the Corporatewide Ethics Program By Julie C. Andrews

Corporatewide hotlines are an essential link in the strong communication effort required to keep the Ethics Program standards visible and alive in daily business activities. Through the hotlines manned by the Ethics Program directors, employees have a readily available channel to ask questions, seek advice, voice concerns or raise allegations about ethical dilemmas.

Many other means are used to keep employees informed about the ethics program, including universal distribution of the standards, referencing the standards in all policies and procedures, regular stories in *General Dynamics*

*World* and posters advertising the hotlines.

"Communication, however, is more than just publicizing the standards," said Kent Druyvesteyn, Staff Vice President-Ethics Program. "True, two-way communication is often the answer to a problem. The hotlines provide the opportunity for two-way communication and the means to answer questions or solve problems close to the source."

Twenty-nine hotlines are located throughout the company, including a special toll-free 800 number to the Corporate Office. The hotline numbers are widely communicated to all employees as well as suppliers and vendors.

Employees are urged to bring questions first to supervisors. If this channel does not work, the hotlines are available.

"The credibility of the hotlines rests on two things: responsiveness and confidentiality," Druyvesteyn said. Callers who use the hotlines are not required to give their names. Every effort is made to protect the identity of employees who communicate with the Ethics Program director and the identity of any other individual who might

(Continued on Page 2)

## Company Ad on Page 10

Another in a series of advertisements the company is currently running in major newspapers and national magazines is displayed on Page 10 of this issue.

## Company Establishes Subsidiary to Support Commercial Launches

A wholly owned subsidiary to provide commercial launch services for the Atlas/Centaur launch vehicle has been established by the company.



Dunbar

The new subsidiary — General Dynamics Commercial Launch Services, Inc. — will provide worldwide marketing, business development, mission analysis and mission management services necessary for launching U.S. and foreign satellites. It will be the customer focal point dedicated to the unique business requirements of commercial launch ventures.

In making the announcement, Herbert F. Rogers, President and Chief Operating Officer, said, "We made a very strong commitment to the satellite launching business last summer when we decided to produce 18 Atlas/Centaurs for the commercial marketplace. The establishment of General Dynamics Commercial Launch Services further reinforces this commitment."

Dennis R. Dunbar, formerly Director of Commercial Launch Services at Space Systems Division, has been named Vice President and Managing Director of the new subsidiary based in San Diego. He will report to Dr. Alan M. Lovelace, General Manager of Space Systems, who will continue to direct all of the space activities for the company.

Dunbar, 43, had been Director of Commercial Launch Services at Space Systems since 1987.

He began his career with General Dynamics in 1967 and moved through a number of design engineering assignments, including Manager-Structural Design for Convair Division Research and Engineering from 1979-80 and Program Director-767 Strut from 1980-83. He was Atlas/Centaur Program Director from 1983-87 with responsibility for all program management activities and Cape Canaveral-based launch services.

Dunbar has a Bachelor of Science degree in Mechanical Engineering from Lowell Technological Institute. He also earned a Master of Science degree in Aeronautical Engineering from San Diego State University in 1971 and a Master of Science degree in Systems Management from the University of Southern California in 1977.

## F-16C/D Fleet Retains High Mission Capability Rate

The U.S. Air Force recently announced that the mission capability of its F-16C/D fleet was rated at 91.3 percent for 1987, continuing the record of over 90 percent mission capability that was established in 1986.

Approximately 400 F-16C/D aircraft flew more than 71,000 separate flights from 10 U.S. bases last year, logging nearly 102,000 flight hours. The USAF said the F-16 continues to be the safest single-engine fighter in history, with a rate of only 4.9 mishaps per 100,000 flight hours.

The service also announced that the F-16C/D radar, built by Westinghouse, "now has a maintenance record inching upward to 100 hours between maintenance actions; this is in comparison with the 30 hours or less between maintenance actions of other fighter radar systems."

## Vice Chairman Oliver C. Boileau Is Retiring; Became General Dynamics President in 1980

On April 30th, following a career in aerospace that spanned four decades, the Vice Chairman of General Dynamics, Oliver C. Boileau, will retire.

Educated as an electrical engineer, his career started in the days of vacuum tubes and continued to the present microchips.

Boileau's first job, delivering mail at the RCA plant in Camden, N.J., was followed by a number of positions of increasing responsibility at RCA, The Boeing Company and General Dynamics. He was named

Vice President of Boeing in 1968 and President of Boeing Aerospace Company in 1973.

In January 1980, he became President of General Dynamics and became Vice Chairman on Jan. 1st of this year.



Boileau

During his career at Boeing, he worked on the B-47 and B-52 strategic bombers, the Boeing 707, AWACS, the Minuteman ballistic missile and the Apollo moon landing program, including the Lunar Rover.

From his St. Louis office as President of General Dynamics, Boileau drove a number of corporate initiatives, including Program Management Seminars, the Quality Improvement Process and the Management Effectiveness Program.

"Every person working in an organization hopes that he will leave some permanent mark on the organization," said Stanley C. Pace, Chairman and Chief Executive Officer. "The mark which Ollie leaves is a better organized, better trained, better functioning General Dynamics than the one he joined eight years ago. He took on a number of major managerial assignments during a difficult period for General Dynamics, and his intelligence, his drive and his wide knowledge have been of great help to the corporation."

(Continued on Page 2)

## Valley Systems, Ford Aerospace Form Team To Compete for Antitank Weapon Contract

Valley Systems Division and Ford Aerospace Corporation (Aeronutronic Division) have formed a team to compete against two other defense company teams for an Advanced Antitank Weapon System-Medium (AAWS-M) contract. AAWS-M is a replacement in the early 1990s for Dragon, the present medium weight shoulder-launched antitank assault weapon.

Valley Systems will mature the design, participate in ongoing test programs and fabricate hardware to provide the most mature technology at the lowest cost and risk for full-scale development, said William L. Keeling, Valley Systems Director-AAWS-M.

The U.S. Army Missile Command (MICOM) is sponsoring three proof-of-principle contracts, including laser beam rider technology that has been proposed by Ford Aerospace.

Testing of demonstration systems is being conducted this year. Later this year the Army is expected to issue a Request for Proposal (RFP) for full-scale development.

The Army acquisition strategy requires the teaming

arrangement to provide qualified competitive sources for the production phases. The two members of the team that is awarded the full-scale development contract in early 1989 will eventually compete against one another for subsequent production contracts.

Keeling said the weapon is "a high priority program within the Army, is well supported by Congress and is a line-item funded activity."

The heart of the Valley Systems/Ford proposal is a missile guidance system based on a shoulder-fired laser beam rider concept. The gunner is in the fire control loop and directs the flight of the missile by sighting directly on the target. The missile is guided to the target by a coded and programmed low-intensity laser beam projected by the launch system. The missile looks backwards and "flies the laser beam" to the target.

The weapon system is based upon the wooden round design principle: The missile is sealed in the disposable launch tube at the factory and mated in the field by the soldier to the reusable Command and Launch Unit.

## Two Navy Tomahawks Fly Successful Missions

Two U.S. Navy Tomahawk cruise missiles flew similar successful flights on March 27th and 28th as part of the Navy's continuing Operational Test Launch program. Both were launched from surface ships in the Gulf of Mexico off the coast of Florida, one from a vertical launch system and the other from an armored box launcher.

The missiles, both land-attack variants of Tomahawk, flew approximately 800-mile missions over portions of rural southern Alabama and northern Florida inland to

the Eglin AFB test range. After successfully overflying the simulated target, the missiles were recovered by parachute on the Eglin range. They will be refurbished for future use.

The two flights brought the number of consecutive successful flights over the Eglin range to nine.

The land-attack Tomahawk variant is in production at Convair. Convair will build 70 percent of the 475 sea-launched cruise missiles under the Fiscal Year 1988 dual-source procurement.



# Oliver C. Boileau Retires April 30th As Vice Chairman

(Continued from Page 1)

His major contributions to General Dynamics include directing the reformatting of the annual Operating Plans to emphasize cash flow as a major item and directing the assimilation of Land Systems Division into the corporation.

Speaking recently about his management of Land Systems, Boileau said, "My time up in Detroit was challenging and fascinating. M1 tank production was increased from 30 a month in March 1982, when General Dynamics took over Land Systems, to 60 a month a year later; meanwhile, man-hours required to produce those tanks were reduced by one third.

"At the same time, the quality of those tanks made a dramatic improvement. The next year, the first Zero Defect M1s and M-60s were delivered — a feat the automotive industry said was simply impossible."

"I worked for Mr. Boileau on a number of the Program Management Seminars," said Michael C. Lucero, Corporate Director-Personnel Planning and Placement. "As a matter of fact, I consider myself a survivor of four of them. They were intensive, exhausting and exhilarating programs designed to equip managers to take on added responsibility midpoint in their careers.

"One of the points Boileau emphasizes is punctuality," Lucero said. "He believes that there is no greater disrespect a person can show than to be late to a meeting he called, so in planning the seminars, meetings began on time and buses left on time. For some of the attendees, punctuality was something new, but Boileau was adamant. The PMS meetings were scheduled to begin and end on time. It was a first experience for some of the people who attended, and I recall one bus leaving on time with four General Dynamics executives running after it waving their briefcases and shouting for us to stop. . . .

"Boileau has a very direct forceful management style, and when he teaches you a point, you remember it. I don't think those four executives ever forgot the importance of being on time. . . ."

Boileau's career began with RCA in 1943. After serving in the Pacific in the U.S. Navy in World War II, he was graduated from the University of Pennsylvania in 1951 with a Bachelor of Science degree in Electrical Engineering and later with a master's degree in electrical engineering. In 1964, he earned a Master of Science degree in Industrial Management from the Massachusetts Institute of Technology.

Boileau is a member of the National Academy of Engineering, a Fellow of the American Institute of Aeronautics and Astronautics, a member of the Air Force Association, the Navy League, the American Defense Preparedness Association, the Association of the U.S. Army and the National Space Club. He also is a member of the Lawrence Institute of Technology Corporation, the Massachusetts Institute of Technology Department of Aeronautics and Astronautics Visiting Committee and the Lincoln Laboratory Advisory Board. He is on the Board of Overseers of the University of Pennsylvania's School of Engineering and Applied Science.

In St. Louis, he is Vice President and member of the Executive Board of the St. Louis Area Council of the Boy Scouts of America, the Board of Trustees of St. Louis University and the Board of Trustees of the St. Louis Art Museum.

## Firm Orders 10 More Cessna Caravan Is

Mid Atlantic of Greensboro, N.C., has ordered 10 more Cessna Caravan I cargo aircraft, expanding its fleet of the single-engine propjets to 20.

Mid Atlantic is a trade name of Atlantic Aero Inc., an aircraft sales and service operation at Regional Airport in Greensboro.

Mid Atlantic operates in parallel with Atlantic Aero's charter department. It serves as both a direct service and a feeder route connection for several of the major all-freight airlines.

Don Godwin, President of Atlantic Aero, said the new Super Cargomaster versions of the Caravan I will be used throughout the United States to haul freight and overnight delivery packages.

Mid Atlantic has been operating five Super Cargomasters and five smaller Cargomasters since last year. Deliveries of Mid Atlantic's new Caravans began in April and will continue through November.

# Current & Comment

*(Observations on news of interest to the company and the industry will appear regularly in this column.)*

**BEAR vs. FALCON.** Chicago Bear Jim McMahon has apparently become the first NFL quarterback to get "sacked" at 15,000 feet. McMahon, visiting the Electronic Systems Division in Bedford, Mass., last month,

received a backseat familiarization ride in an F-16 Fighting Falcon. A few loops later, the part-time Taco Bell promoter was scrambling for the pocket. On landing, he proudly displayed a well-used air sickness bag to rampside fans at Hanscom Field. Said McMahon: "Something I'll never forget. And something I'll never have to do again."

\* \* \*

### NO ARGUMENTS HERE.

- "Program risks to increase substantially"
- "Increased competition based more on price than technological differentiation"
- "Potential repetition of procurement problems of the late 1960s"
- "Significantly reduced profitability" which "will depress stock prices and increase industry's cost of capital. . . ."

These are only some of the potential problems facing the defense industry, suggests a recently completed independent study on government acquisition and tax policy changes. According to the report of the Cambridge (Mass.)-based MAC Group, the industry can expect these consequences and more "if the 1984-1987

procurement policies are allowed to run their course."

"Left unresolved," the study summarizes, "these industry conditions may result in loss of technological leadership, a less efficient industry, an industry vulnerable to foreign competition — and less competition.

"These outcomes are not consistent with the maintenance of a strong defense industrial base. Rather, they are the result of a combination of changes whose total impact was neither foreseen nor intended."

"Solutions have to address both profitability and risk," concludes the report. "While we cannot provide a precise answer, conceptually the answer is that defense industry returns should be commensurate with the risks involved."

## Subcontractors Named for A-12 Components By General Dynamics/McDonnell Douglas

Subcontractors for six major aircraft components have been announced by the General Dynamics/McDonnell Douglas team that is designing the A-12 advanced tactical aircraft for the U.S. Navy.

The firms are Westinghouse Electric Corporation, Norden Systems Division of United Technologies Corporation, Texas Instruments, Inc., the Government Aerospace Systems Division of the Harris Corporation, Amecom Division of Litton Aero Products, Aircraft Electronics Division of General Electric Company and Garrett Controls, a unit of Allied Signal Aerospace Company.

The A-12 will replace the A-6 Intruder as an all-weather attack aircraft based aboard aircraft carriers.

Westinghouse was awarded a contract to develop and test the combined function FLIR (Forward Looking Infrared) System for the A-12.

Norden and Texas Instruments will develop and test the A-12's multifunction radar.

Harris' Government Aerospace Division will develop and test the multifunction antenna system.

Amecom was awarded a contract to develop and test the electronic surveillance measures set.

The Aircraft Electronics Division will develop and test the missile warning set system.

Garrett Controls will develop and test the conventional air data computer system.

Navy plans call for Westinghouse, Harris, Litton, General Electric and Garrett to develop second sources in the early phases of the program for a competitively shared production during the later phases. The plans also call for a competition between Norden and Texas Instruments during the program's production phase.

## Corporatewide Hotlines Are an Essential Link

(Continued from Page 1)

be named. Hotline phones have no trace features and message recorders are kept in locked cabinets.

Ethics Program directors are trained in the special listening skills necessary to be responsive to concerned employees, and targets have been set for assessing the timeliness of responses.

Record-keeping procedures also safeguard the identity of hotline users from anyone outside the program, including top management and internal auditors. The only data compiled on the program is statistical, showing the types of calls to the hotline, the seriousness of the subject raised in the call, the number of calls for each of the ethics standards and the sanctions imposed after investigation of an allegation.

In 1987, Ethics Program directors received 5,760 communications, compared to 3,646 in 1986, the first full year of the program. Of those 5,760 communications in 1987, 3,197 or 56 percent came over the hotlines. Nearly two-thirds of all communications were from employees seeking information or asking for advice about the meaning or application of the standards.

In 1987, slightly more than 12 percent of all communications were about time card reporting. Nearly 16 percent were about possible conflicts of interest involving either the giving of items of value to customers or the receiving of items of value from suppliers. Nine percent involved concerns about company and customer resources.

The largest number — nearly half — of all communications involved relationships among or between employees.

This led to creation of the Personnel Ombudsman Program in March 1987, which itself logged 4,685 communications in 1987.

"The data show the value of the hotlines as a communication tool," Druyvesteyn said. "They are not primarily an avenue for whistle-blowing or 'ratting' on a fellow worker, an accusation sometimes made about the program. Rather, the biggest majority of the people calling the ethics hotlines are looking for information or seeking advice, particularly about universal concerns such as time card reporting and conflicts of interest, areas that are of major importance to the way we do business."

When a call comes in on an ethics hotline, the Ethics Program director makes a preliminary assessment of it by priority. Priority 1 communications involve concerns or allegations that because of their potential seriousness could lead to criminal or civil prosecution, congressional or other government investigation.

Priority 2 communications appear less serious in nature and do not appear to involve violation of laws or contractual requirements. Priority 3 communications involve all other possible concerns, including simple requests for information or advice concerning the meaning of ethics standards.

In 1987, less than 1 percent of the communications received — 26 communications in all — were first classified as Priority 1. Priority 2 communications represented 12.5 percent. The rest — nearly 87 percent — were Priority 3.



# Space Systems Delivers Its Last Atlas E to the U.S. Air Force By Julie C. Andrews

When the General Dynamics Space Systems team at Vandenberg AFB (VAFB), Calif., delivered the last Atlas E to the U.S. Air Force on March 31st, it marked the end of an era. However, it also marked the beginning of a new role for the reliable space booster, as work for the Space Systems team at VAFB will transition to assembly of the Atlas for the commercial launch services program.

General Dynamics has been modifying and refurbishing Atlas ICBMs for space launch boosters since 1965. Atlas launches are a combined effort of Space Systems and the Air Force.

General Dynamics and Air Force representatives attending the March 31st ceremonies heard Maj. Gen. Donald L. Cromer, Commander-Space and Missile Test Organization, and William G. Phillipp, Atlas and Atlas/Centaur Program Director, praise the teamwork behind the success of Atlas.

"From the first Atlas modification team in 1965 to the present, you have integrated some of the most innovative and advanced technologies in use today," Phillipp said. "The Atlas technology was revolutionary for its time and some thought it was not viable. But here we are some 30 years after the first Atlas launch, demonstrating the fundamental soundness of the Atlas concept time and time again."

The Space Systems/Air Force team at VAFB is the current holder of the longest running record of launch successes in the world, with 17 straight Atlas launches without a failure, Phillipp said.

A total of 492 Atlas vehicles have been launched since June 1957, including 271 from Vandenberg AFB. Atlas launch vehicles have flown many deep space missions for

America including Pioneer, Ranger, Mariner, Lunar Orbiter and manned Mercury missions.

Modification of Atlas ICBMs to space launch vehicles over a lifetime of almost 25 years and a total of 95 vehicles is estimated to have saved the Air Force more than 65 percent of the cost of constructing new-build vehicles, Phillipp said.

Atlas 45E, the vehicle delivered on March 31st, was

produced and assembled in 1961 at the former Astronautics Division in San Diego, and sold to the U.S. Air Force in April of that year. It stood ICBM duty at Forbes AFB in Kansas from September 1961 to January 1965, when it was sent to Norton AFB, Calif. Later it was identified as a possible exhibit missile for the Smithsonian Institution. It was sent to Vandenberg in September 1985 to be modified.



Ceremonies Marking Delivery of the Last Atlas E to the Air Force at Vandenberg AFB, Calif., on March 31st

## General Cromer Praises Atlas as It Leaves Government Service for the Commercial World

*(Shortly after Maj. Gen. Donald L. Cromer appeared at the March 31st delivery ceremony of the last Atlas E to the U.S. Air Force, the service announced that he was being promoted to lieutenant general and assigned as commander of AF Space Division, Los Angeles. Following is the complete text of the general's remarks at the Atlas E delivery.)*

With today's ceremony, I feel that I have come full circle with the Atlas program. My first assignment in the Air Force was with one of our very first Atlas ICBM units at Offutt AFB. My first TDY (temporary duty) was to San Diego to learn what the missile was all about. I later stood alert on the plains of Nebraska and Iowa — working long hours to keep those early missiles on alert. And now, I'm honored to be here today to witness the delivery of the final Atlas.

Most of you know the fine history of the Atlas — its use as our first manned launch vehicle with the Mercury program — and its great record as a space launch vehicle. Today, I want to take just a minute and focus on what the Atlas has done for us lately.

Over two years ago, as you are aware, the U.S. space program got into deep trouble when we experienced back-to-back failures of the Titan 34D, coupled with the tragic loss of Challenger. As a result of these accidents, we lost most of our ability to replenish our satellites. The space assets which we had spent so much time and money building were in jeopardy of dying on-orbit before we could replace them.

A headline in the Los Angeles Times reported 'Pentagon Access to Space Crippled by Disasters.' They weren't far off the mark.

It was a terrible year for the U.S. space program with failures in the Titan, Shuttle and Delta programs. But during these failures we had one consistent performer — the Atlas. In fact, I would say that Atlas played a crucial role in maintaining our spirits and morale during the long, dry spell between launches.

So, today we are witnessing the end of an era. It started as our nation's first ICBM and ends with the delivery of the last government booster by General Dynamics Space Systems Division.

However, it has been said that when one door closes, another opens, and so it goes for the Atlas. Like many of us do when we retire, the Atlas is leaving government service to enter the commercial world. I'm sure that its heritage will follow it and that it will continue to rack up success after success as a civilian.



**Vice President Visits Fort Worth.** Vice President George Bush inspects an F-16 cockpit during a visit to the Fort Worth Division on April 8th for briefings and F-16 program familiarization. Bush "flew" an F-16 simulator for 30 minutes and watched an F-16 aerial demonstration flown by Kevin Dwyer, Fort Worth's Chief Test Pilot. Bush said the division "is putting out the finest airplanes in the world."

## Fortune Magazine: 'F-16 Is One of Best U.S.-Made Products'

Fortune magazine reported in its March 28th issue that the Fort Worth-built F-16 Fighting Falcon is one of 100 U.S.-made products that are the best in the world.

The article, under the heading "What America Makes Best," reported on a survey the magazine conducted and said: "F-16 Aircraft. Wolfgang Demisch, director of research for UBS Securities and an aerospace analyst, describes General Dynamics' plane as 'the standard setter for combat aircraft. . . It keeps the peace and we sell a lot of them.' F-16s are powered by General Electric or Pratt & Whitney jet engines, which are standard setters in their own right. They also come packed with the most advanced gadgetry, including guidance radar from Westinghouse. Now 14 years old and selling for \$18 million, in its class the plane is still top gun in a dogfight."

One of the photographs accompanying the article showed the final assembly of F-16s at the Fort Worth plant.

## Citation Is Certified

Cessna Aircraft Company's Citation III business jet has been certified by the West German federal aviation authority, LBA, for operation in that country.

The Citation III is the first new technology business jet certified in Germany. There are 22 Citations currently based there, the largest fleet of business jets in West Germany.





**Going for the Gold.** Larry Myricks, Valley Systems Division Human Resources Representative, is the second-ranked long jumper in the world and hopes to compete in the Olympics in Seoul, South Korea, in September. He was a member of the 1976, 1980 and 1984 U.S. Olympic teams and will participate in the U.S. Olympic trials in Indianapolis in July. Myricks is able to pursue his goal and still work at Valley Systems because the division participates in the U.S. Olympic Committee's Job Opportunities Program. The program provides athletes who possess high Olympic talent with a degree of financial security and an opportunity to build toward a productive career. As a participant in the program, Valley Systems provides the necessary time off for Myricks to train and compete in national and international events.

Savings and Stock Investment Plans			
Annual Rate of Return for the 12 Month Period Ending:			
Salaried	Feb. 1986	Feb. 1987	Feb. 1988
Government Bonds	17.0%	9.2%	6.9%
Diversified Portfolio	35.8%	31.9%	(4.3)%
Fixed Income	12.3%	12.0%	11.2%
Hourly			
Government Bonds	16.4%	9.4%	7.1%
Diversified Portfolio	35.8%	33.4%	(4.4)%
Fixed Income	12.4%	11.9%	11.2%
GD Stock Closing Price	\$76.62	\$78.75	\$52.50
( ) Negative number			

GENERAL DYNAMICS

World

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*Companywide Employee Survey Reports* Compiled by Sue L. Shike

Company Encourages Effective Computer Resources

Survey responses indicated that 35 percent of employees — many of them engineers — were not satisfied with their access to the computer systems needed to help the employees do their work.

A Computer Policy Action Team, led by Dr. Leonard F. Buchanan, Corporate Vice President-Technology Development and Engineering, and Michael C. Keel, Corporate Vice President and General Manager-Valley Systems Division, was formed to address these concerns and provide recommendations to the Executive Office. The team included employees from Convair, Fort Worth and Data Systems. The team concluded the following:

- Because each division has unique business requirements, division management is best suited to determine the number and type of computers that are needed for maximum efficiency. Division managers are in a better position than ever before to purchase needed equipment because the level of capital investment that can be approved by division general managers was recently

raised to \$2 million.

- The divisions will be encouraged to support capital investment for computers in cases where such investment will be beneficial. Because wages and benefits costs are significant, the cost of a personal computer will be recovered on a timely basis if an improvement of 2 percent in individual efficiency is achieved by the computer's use. Capital investment in computers will be discussed at future general management performance reviews.
- The divisions are being asked to establish long-range strategic plans that use computer-aided engineering, computer-aided design and manufacturing and integrated business systems for product design, manufacturing and support activities. Buchanan and B. Edward Ewing, Corporate Vice President-Operations, supported by Data Systems Division, will work with the divisions in developing these plans and identifying common elements for companywide use.

\* \* \*

Changes Recommended in Salaried Overtime Policy

Based on comments from the employee survey, a corporatewide team led by John E. McSweeny, Vice President and General Manager-Convair, recently recommended changes in the policy on salaried overtime. Following review by Stanley C. Pace, Chairman and Chief Executive Officer, and his executive team, the modifications discussed in the corporate review are being included in a policy revision.

The revised company policy on overtime will be sent to the divisions for review and comment. The revisions will include clarification of eligibility requirements for directed overtime compensation and increases in the maximum salary caps to reflect changes in the present salary structure. In special, very limited circumstances where a group or individual is required for business reasons to work other than normal hours, the use of special work weeks is defined. For employees who have worked extended work weeks for unusual lengths of time without compensation, a new provision for "recognition time off" could be used with general manager approval.

The corporatewide team included representatives from Laser Systems (a recently formed unit of General

Dynamics that is based in San Diego), Data Systems-Western Center, Convair, Pomona and Valley Systems. In developing its recommendations, the team compared current policy with that of other companies and also gave consideration to professional responsibility and the effects of excessive overtime on the employee's personal life. The issue is very complex because it deals with compensation, rewards for noncompensation and fairness of administration. The committee developed approaches to:

- provide increased flexibility to the supervisor;
- clearly identify extended work week eligibility;
- recognize extended periods of overtime;
- encourage the use of a special work week to maximize the use of assets;
- provide for recognition of those who consistently work an uncompensated extended week;
- and have minimum impact on cost competitive-

ness.

Once the divisions have commented on the proposed policy revisions, the implementation of any changes will include a supervisor training package on the philosophy and function of the policy.

Changes Are Made in 'Revolving Door' Policy

Recent changes in federal legislation and the implementation of new regulations have resulted in the company's modifying its policy for compensating individuals who are former U.S. Government or military employees.

Michael C. Lucero, Corporate Director-Personnel Planning & Placement, said that affected employees and their supervisors should immediately familiarize themselves with these changes, as reflected in "Compensation and Employment of Current and Former U.S. Government Employees" (CPP 22-314).

"This is especially critical since company policy is generally more stringent than the government's requirements," Lucero said. "All company employees are expected to comply strictly with the restrictions that apply to them."

Lucero said the most significant change is the addition of a compensation restriction.

"In addition to precluding the full-time employment of certain former government employees, it also prohibits

compensating them for nonfull-time work in excess of \$250," Lucero said. "This restriction applies to certain consultants and contract employees."

"In addition, the new legislation expands certain post-employment restrictions to all retired military officers rather than the previous restrictions that applied only to retired regular military officers," Lucero said. "Finally, the former lifetime restriction on retired officers selling to their former service has been reduced to three years."

"Each year on April 1st, the company must submit a report to the Department of Defense listing those affected former DOD employees and military officers that the company has employed or compensated during the previous year," Lucero said.

Employees with questions regarding the policy should contact their supervisors or the Human Resources Department, Lucero said.

Reduction in Paper Usage Promotes Company's Cost Competitiveness

As one element of the company's initiative to become more cost competitive, Fort Worth and Data Systems Central Center have joined forces in a successful campaign to reduce paper usage.

Fort Worth and the Central Center generated approximately 160 million pages of printed computer data in 1987, compared to 200 million in 1986 — representing a 20 percent reduction. Don H. Huckaby, Division Vice President-Central Center, said the reduction is the result of "overwhelming cooperation and support demonstrated by all participants in the effort."

"The reduction is especially impressive when compared to the steady increase that has occurred in our business activities on the F-16 and advanced programs in the last two years," said Robert L. Stevens, Chief of Operations

Support for the Central Center.

The Paper Reduction Program began at the Texas facilities and other General Dynamics locations in response to a goal established in 1986 by Vice Chairman Oliver C. Boileau, president of General Dynamics at that time. Boileau called for a 10 percent reduction in paper usage at all company locations.

To reach the goal at Fort Worth, an educational process started at the upper management level and worked down, Stevens said. "Presentations and training courses relative to software products that can facilitate paper reduction were used. The initial intent was to inform people of alternatives to paper reports, such as on-line distribution systems," he said.

Within Fort Worth and Central Center, the program

has resulted in considerable paper usage reductions in almost all functional organizations. The division's Engineering Department, for example, used 14.4 million printed data pages in 1987 compared to 18.2 million in 1986, despite a considerable increase in engineering activity.

"The program can be credited with sizable cost savings that far exceed the value of the paper that has been saved," Huckaby said. They have resulted in reduced delivery, processing and maintenance costs. "There also are savings in the potential cost of new printers that might have been acquired if there hadn't been a reduction," he added.

A corporate goal of five percent paper reduction has been set for 1988.



## Chairman and President Emphasize 'Absolute' Need to Reduce Costs By Joe Stout

Stanley C. Pace, Chairman and Chief Executive Officer, and Herbert F. Rogers, President and Chief Operating Officer, described General Dynamics' need to become more cost-competitive as "absolutely essential" and "absolutely necessary" in speeches they made recently at separate company functions.

In his remarks, Pace emphasized that today's defense procurement environment entails two kinds of competition: technical competition and price competition. "The emphasis on the price competition is somewhat new," he said.

"Of the 14 largest defense programs in General Dynamics, 12 are second-sourced or are programs where we will be bidding head-to-head in price competitions," he said.

Companies that understand the new environment and respond to it will be able to advance in it, Pace said. "However, the companies that don't understand it, and think it is business as usual . . . are the ones that are going to fall back and lose jobs," he said, addressing members of Fort Worth's National Management Association chapter.

To illustrate second-sourcing, Pace cited production of Sea Launched Cruise Missiles by Convair and McDonnell Douglas.

In some new programs, such as the General Dynamics/McDonnell Douglas Advanced Tactical Aircraft (ATA), or A-12, the company will eventually price-bid for its share of production against other members of an industry team, he said.

To be successful in future competitions, it is imperative that the company achieve overall cost reduction now, even in programs that are currently single-source like the F-16 Fighting Falcon fighter and the M1A1 Abrams tank, Pace said. "I think that this is a very important message," he said.

He pointed out that McDonnell Douglas has set a goal of reducing the cost of the F-15 Eagle fighter by 30 percent over the next few years.

Rogers made similar comments to representatives of virtually every division of the company at the kickoff meeting for the corporatwide Variability Reduction Pro-

gram. "When you talk to the customer about cost and quality, it means not only at the end of the production line, but also 10 to 20 years later, out in the field," he said.

"This affects every defense division that we have," he said. "Today, you may compete to win, and you may win. But then you're going to compete to stay in the business."

"Since price is the (dominant) issue right now, we've got to find ways to reduce the cost of our product, both to build and deliver, and then to operate," Rogers said. "We reduce price by reducing cost. It's very simple and very fundamental."

"We are in a very competitive world," Rogers said. "We are competing, even on a sole-source contract, with the fact that there isn't enough money to go around (in the defense procurement budget)," he said.

"This corporation is in a circumstance that is 'survival of the fittest' for the next five or six years. We intend to come out on top," he said.

## Thunderbird F-16s and Other GD Products to Star at Air Show By Julie C. Andrews

The people and products of the General Dynamics aerospace divisions will play major roles at Air/Space America 88, an international electronics and aerospace trade exposition May 13th through 22nd at Brown Field near San Diego.

General Dynamics' exhibit will bring together the key programs and capabilities of the aerospace group, including the three divisions in San Diego — Convair, Space Systems and Electronics — as well as the Pomona, Valley Systems and Fort Worth divisions. The exhibit will place special emphasis on the competitive marketplace of commercial and government space programs.

The company is one of seven corporate founders of the show, which its organizers say is the largest and first of its kind in the United States.

"As the largest private employer in San Diego County, the company was motivated to support Air/Space America as a community relations project," said Fred J. Bettinger, Staff Vice President for Business Communications. "It also gives us, as employees of General Dynamics, the opportunity to be visible in a big way in the community in which we live and work."

General Dynamics employs about 26,000 people in Southern California.

Tickets for the weekend air shows during the event will be made available to General Dynamics employees at a 50 percent discount. The Convair Recreation Association in San Diego is coordinating ticket sales, and tickets will also be available at Pomona, Valley Systems and Fort Worth.

Of special interest to General Dynamics employees, the U.S. Air Force Thunderbirds, flying the F-16 Fighting Falcon, will make their first appearance in San Diego. The Thunderbirds will perform both days of the second weekend, May 21st and 22nd. Also on display will be an F-16N from Miramar Naval Air Station, used as an adversary aircraft in the Navy's "Top Gun" school, and four Convair-built F-106 Delta Darts about to be retired from the Air National Guard. Other aircraft on display will include the F-14 Tomcat, F-15 Eagle, F/A-18 Hornet, B-1B bomber, the SR-71 Blackbird and the Concorde supersonic



Among the Attractions at Air/Space America 88 Will Be the U.S. Air Force Thunderbirds Precision Flight Team

airliner.

Both weekends of the show will be open to the public. The weekdays from May 16th through 20th are trade days and are reserved for military, government and industry representatives.

Founders of Air/Space America envision a biennial exposition that will eventually rival the Paris, Farnborough and Hanover air shows. The number of domestic and foreign exhibitors that have signed up for the show was approaching 300 as of mid-March.

## M1A1 to Get Improved Heavy Armor of Depleted Uranium By Donald L. Gilleland

Land Systems will soon start installing a new and improved heavy armor package in the M1A1 Abrams main battle tank. The new armor incorporates steel-encased depleted uranium, which is two and one-half times denser than steel.

The new package was announced by the Department of Defense last month.

The package, which was developed by the U.S. Army after extensive testing, provides better ballistic protection and greater survivability for tank crews. Because of its metallurgical properties and high density, depleted uranium will be more effective than conventional armor steel in stopping an enemy projectile. This improvement culminates several years of research and development to meet improvements in Warsaw Pact antiarmor weapons and will allow the Abrams to meet the anticipated threat well into the 1990s. The Abrams upgrade represents a significant enhancement of U.S. conventional defense capabilities.

Depleted uranium, which is already being used by the U.S. Army for penetrators in its kinetic energy tank rounds, is also used in a broad spectrum of civilian applications, particularly where heavy weight is needed in a

small space. It is a source of very low level radiation, but its presence in the armor package will not be a risk to employees or Army crews who operate the tanks.

Land Systems officials participated in extensive studies and tests conducted by the Department of the Army that proved the radiation levels in the new armor package are no more than citizens face every day in their normal environment. Sealed within the tank, the depleted uranium will have a very low level of natural radiation that is well within the acceptable range established by the Nuclear Regulatory Commission.

Maj. Phil Soucy, a U.S. Army spokesman, said, "Because the uranium is sealed within layers of differing-tensile steel, exposure to tank crewmen will add up to no more than the equivalent of three chest x-rays a year. Exposure to employees who build the tanks will be considerably less."

"You would have to sunbathe on the tank for 75 hours straight to get the equivalent of one chest x-ray. The average American gets more radiation from watching TV. Watching TV five hours per day will expose you to the equivalent of one chest x-ray every 90 days."

The new armor package will be delivered to Land Systems already encased in steel and will be installed in

tank turrets at the Lima Army Tank Plant, Lima, Ohio. While the turrets will be assembled on tanks at the Lima plant and at the Detroit Arsenal Tank Plant, Warren, Mich., no depleted uranium will be stored at the Detroit plant.

A pilot program will begin shortly at the Lima plant, but full integration of the new armor package into production will not begin until summer, with first delivery of completed tanks to the Army in October.

According to Darryl Spencer, Land Systems Director, Health and Safety, plant managers have scheduled training sessions for all employees who will work with or come in contact with the turret. "Every plant employee who has a question or concern will have an opportunity to discuss it," he said. "We have taken every precaution to ensure the continued safe working environment for our employees."

As an added measure of safety, the United Auto Workers and company Health and Safety Departments will continue to monitor the environment to ensure that the radiation readings stay well within the accepted standards.

Other details of the armor improvement program are still very highly classified, according to Army officials.



## Ground Breaking Held For Scranton Plant Warehouse Addition



**Digging In.** Breaking ground for a \$1.7 million addition to the Land Systems-leased plant near Scranton, Pa., are the Hon. Joseph M. McDade (left), U.S. Representative from Pennsylvania, and George A. Stathopoulos, Land Systems Scranton Plant Manager, as officials from the plant, the county and the state look on.

Government and company officials recently broke ground for a \$1.7 million addition to a plant leased by Land Systems near Scranton, Pa.

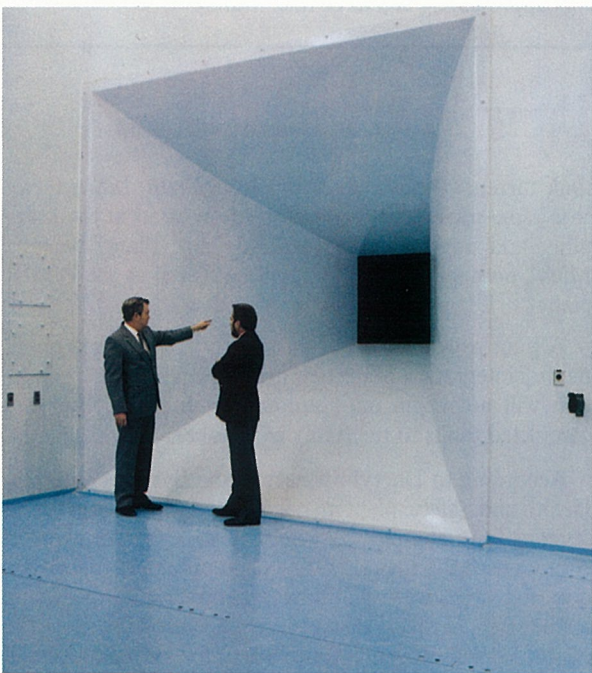
The Hon. Joseph M. McDade, U.S. Representative from Pennsylvania, headlined the ceremonies.

"I am proud to be here today for the ground breaking of General Dynamics' expanded warehouse facility," McDade said. "General Dynamics has been a strong working partner in this community and a major contributor to our national defense."

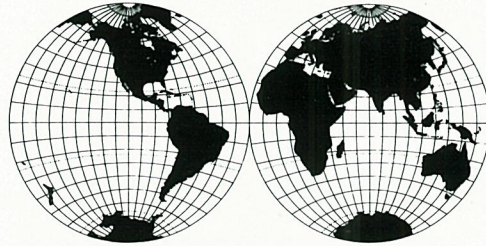
"America's defense industry has become increasingly complex as a result of new technologies and increased competition," McDade said. "But General Dynamics has shown, through its work at this facility and others, that it can deliver quality equipment at the lowest possible cost."

A 200 x 250-foot prefabricated metal building will be added to the rear of the facility, increasing the size to 280,000 square feet. The addition will consolidate warehouse facilities and free much-needed manufacturing space within the existing building. The addition can also accommodate light manufacturing operations. Construction of the project will begin this spring and is expected to be completed by October.

The Scranton Plant manufactures parts and assemblies that make up the tank's suspension system, commander's weapon station, gunner's primary sight and turret and a variety of other components used in the production of M1A1 tanks in Lima, Ohio, and Warren, Mich.



**Not For Easy Listening.** Donald A. Nirschl (left) and Michael H. Smith stand in front of a 12 x 12-foot horn in an acoustic test chamber at Space Systems Division in San Diego. The horn can produce sound levels up to 154 decibels higher than the noise of a commercial jet taking off. The chamber tests a spacecraft's ability to operate properly after blastoff by simulating the extreme vibrations the spacecraft endures during launch.



## Around the World

**CHQ:** John M. Elmers was promoted to Corporate Manager Manpower Systems & College Relations.

**Convair:** Vernon H. David was appointed to Quality Assurance Director... Vernon E. Mullikin to Program Director-Hypersonic Technology Program... Dwain G. Rice was promoted to Program Quality Assurance Manager... Robert L. Allen to Property Administration Manager... John S. Baltutis, John E. Beard, Donald R. Booher, Kuo-Hung Chang, Phillip S. Marsden, Joel A. Opsahl and Wang Tang to Senior Engineering Specialist... David L. Berry and Stanley T. Jones to Quality Assurance Supervisor... Dennis M. Franich, Bruce D. Markle and James C. Trojanowski to Engineering Specialist... Charles M. Dombrow Jr. to Plant Protection Lieutenant... Robert D. Fluty to Financial Supervisor... Keith C. Forbes to Systems Safety Engineering Specialist... Russell E. Gaugler to Industrial Engineering Specialist... Jane L. Gregory to Group Engineer... Steven W. Lass to Plant Services Operations Supervisor... Leon S. Meaux to Quality Control Chief... Mark A. Perkins to Procurement Administrator... Mark E. Russell to Quality Assurance Project Administrator... David D. Samudio to Manufacturing Operations Supervisor.

**Space Systems:** Bill Shiba was promoted to Engineering Manager... Dennis W. Lieurance to Program Manager... Steven A. Kewley to Engineering Support Manager... Darrell N. Blalock, Carol Orav and William A. Jones to Engineering Chief... Wesley Bachman to Group Engineer... Richard C. Flowerree, Lewis R. Fowler and Philip J. Lowry to Senior Engineering Specialist... Larry B. Foss to Senior Financial Specialist... Donald R. Gowin to Manufacturing Operations General Supervisor... Robert F. Noe to Manufacturing Control Operations General Supervisor... Curtis L. Johnson to Graphics Services Supervisor... Marianne M. Andres to Data Management Supervisor... Samuel H. Packer to Configuration Management Supervisor... Paula J. Parmentier to Financial Supervisor... Robert A. Vogel to Chief Project Engineer.

**Electronics:** Terry F. Carlson and Eugene V. Rinehart Jr. were promoted to Operations Manager... Mark D. Chesney to Associate Engineer.

**Pomona:** Timothy D. Vayhinger was appointed to Director-Program Administrator... Dennis C. Barlett was promoted to Engineering Specialist... Raymond M. Cooper and Perry D. Homuth to Group Engineer... Loretta J. Davis and Juis E. Padillia to Project Coordinator... Daniel Y. Eng to Manufacturing Development Engineer... Steven R. Fitzpatrick to Senior Electronics Engineer... Bonnie J. Gregg to Senior Financial Analyst... Susan A. Holcombe to Project Engineer... Charles W. Kessel to Guard Chief.

**Valley Systems:** James A. Giglio was promoted to Group Engineer... Robert G. Merritt to Proposal Development Manager... Joseph D. Weber to Quality Assurance Chief.

**Land Systems:** Earl M. Mustonen was appointed to Quality Assurance Director... Dolores L. Darios was promoted to Office & Technical Services Manager... Beverly M. Sanborn to Administration Supervisor... George O. Burns to Foreman... Suman K. Hukku and Gilbert S. Rice to Quality Assurance Supervisor... Edward D. Lewis to Quality Assurance Engineering Supervisor... Andrea S. Stamps to Senior Quality Assurance Engineer... Dennis D. Zasuwa to Project Engineering Assistant... Michael A. Pantano to ILS Operations Chief... Matthew J. Lambert, John Hall Jr., Joseph P. Riolo, Philip J. Deegan and Stanislaw Krasucki to Engineering Chief... John J. Gavin, James M. Graziano, Nazir M. Khan and David T. Ng to Engineering Supervisor... Tatiano C. Padula to Principal Engineer... Gary L. Hadding, William H. Pullom and John J. Teets to General Foreman... Kenneth B. Palmer and Michael S. Trigilio to Superintendent... George Turner to Material Planning & Control Supervisor... Charlotte D. McNamara to Quality Control Engineering Senior Supervisor... Perry J. Wise to Skilled Trades Inspection Foreman... Gary L. Bashore to Senior Instructor/Trainer... Gregory L. Wigal and Gaylord E. Sayre Jr. to Foreman... David B. Page to Subcontract Administration Chief... Gail M. Small to Material Planning & Control Chief... Joseph A. Evans to Offset Administrator... Frances J. Kaelin to Engineering Program Chief... Deborah Cypher to Procurement Planning Supervisor.

**Electric Boat:** James J. Fantarella, Edward A. Loneragan and Alfred C. Malchiodi were promoted to Chief Engineer... William F. Phillips to Engineering/Design Services Manager... Anthony E. Wagner to Engineering Chief... Alfred Siciliano to Design Chief... John V. Basso to Inventory Control Chief... John D. Grispio to Purchasing Chief... Richard A. Cady and Harold Mackey to Engineering Supervisor... Eric S. Jay to Engineering Administration Supervisor... Kathy Karmazin-Calin to Quality Engineering Supervisor... Robert B. Sikora to Senior Lab Services Supervisor... John R. Radley to Technical Services Supervisor... David B. Burley, James P. Gildart, John M. Higgins, Barry E. Lewis, Joseph I. Piller, Thomas M. Rittweger and Paul A. Rogers to Nuclear Test Supervisor... Maurice R. Lamb and George E. McPherson to General Foreman... Michael D. Broughton, Bruce E. Laney, Gregg C. Martin and Mark E. Rogers to Foreman... Andrew M. Depino and Wayne J. France to Purchasing Agent... Danny O. Dailey to Assistant Chief Nuclear Test Engineer... At Newport, Edward A. DeGregorio to Chief Engineer... At Kesselring, Thomas E. Parker to Engineering Chief... At Charleston, Bruce Appell to Foreman.

**Data Systems:** At Western Center, Herbert M. Sinnen was promoted to Project Director-Software Systems... At Pomona/Valley Systems, Bernard C. Pursley Jr. to Engineering Software Chief... At Central Center, Michael R. Lloyd and Donald R. Neel to Engineering Software Chief... Donald E. Harris to Corporate Office IRM Manager... Richard V. Drummond to Electronic Mail Systems Manager... William D. Wiseman and Mickey J. Smith to Engineering Software Supervisor... At Eastern Center, Lee L. Hess and Karen M. Hohenleitner to Project Engineering Supervisor.

**Cessna:** Eugene Rainville was appointed to Citation Sales Director.

**Fort Worth:** Ralph A. Capshaw, Robert M. Drewry and Donald W. Jones were appointed to F-16 Programs Director... George H. Hayward Jr. to Program Director... Sherman K. Jackson Jr. to Engineering Director... Philip E. Beck, Oliver V. Lee Jr. and Bernard Thompson were promoted to Engineering Administrative Group Supervisor... Willie S. Bennett II, Jesse M. Boulware, Donald J. Duncan, Harry O. Gaffin Jr. and Larry N. Lydick to Engineering Project Manager... Gary G. Blackman to Production Specialist... Delbert E. Briley Jr., Donald E. Frazier and Elzy B. Washington to Superintendent... Kurt R. Carter to Foreman... Raymond J. Caughlin to Estimating Manager... Joe G. Chamness to Office Services Supervisor... Donald R. Clawson to Quality Assurance Management Specialist... Richard T. Clothier, James L. McHale and Kenneth W. Watson to Manufacturing Technology Supervisor... Phillip R. Craddock, Robert L. Daniel and Phillip H. Stumph to Estimating Chief... Thomas E. Devern Jr. to Engineering Manager... Debby K. Dunlap and Karen M. Skjolsvik to Scheduling Specialist... Robert K. Eby Jr. to International Business Manager... Sonny E. Ellis to Tool Manufacturing General Foreman... Kenneth E. Glascock to Financial Supervisor... Russell O. Goff and Kirk D. Taylor to Project Coordinator... Howard J. Goodman and Hugo E. Heyns to Project Manager... Carole J. Granger to Senior Engineering Change Analyst... Michael R. Greenfeder to Plant Services Chief... Rickey D. Harwell to Self Governance Program Manager... Walter M. Holcomb Jr. to Logistics Group Supervisor... Dennis J. Iannazzo and Joe D. Patrick Jr. to Senior Program Analyst... David L. Marion, Gary J. Reisor and Rod Syfert to Engineering Chief... Randy D. Mason, Leroy Simmons and Ernest A. Wilson to General Foreman... James G. Massie to Tool Planning Supervisor... Robert M. McIntosh to Program Manager... Michael D. Monticello to Senior Logistics Specialist... Betty L. Nelson, Danny E. Rape and Guy G. Warren Jr. to Engineering Group Supervisor... Robert E. Parker to Field Operations Manager... Frank B. Pyne to Manufacturing Control General Supervisor... Robert S. Rearden Jr. to Electronic Manufacturing Center Production Manager... T.C. Reed to Industrial Engineering Supervisor... Drexel L. Rutledge to Logistics Chief... John M. Stratton to Engineering Manager... James L. Wooley to Human Resources Administrator.



## Employees and Families Have Different Style of Living in Venezuela By Joe Stout

Employees in Fort Worth's Logistics and Support Department have found enjoyment as well as challenges in an unusual living experience with their families as General Dynamics technical representatives in Venezuela.

Lee H. Noyes, David B. Galloway, John E. Trevino, Kenneth L. Faires and Ronald E. Burns have been living in Maracay for varying lengths of time while assisting the Venezuelan Air Force in assimilating F-16s into its inventory.

"To live and work in Venezuela is quite an experience," said Noyes, the support team's lead representative. "It sometimes has its shortcomings, like any other place, but the good outweighs the bad by a long shot."

"It is certainly educational because we can see changes being made that will enable this developing nation to maintain its stature as one of the most modern countries of South America," he said.

Noyes is accompanied by his wife, Patricia, in Venezuela. Galloway lives there with his wife, Rebecca, and their two small children. Burns lives in Maracay with his wife, Ana, and 1-year-old son Ronald. Faires lived in Maracay with his wife, Maria. Ken and Maria returned to Fort Worth in late February after completing a three-year assignment. Trevino, who is single, is scheduled to return to Fort Worth soon after a two-year assignment.

Venezuela, located in the northernmost part of South America, is about a three-hour airplane ride from Miami. "It is a relatively small country, but it offers an abundance of things to do," Noyes said. Entertainment and dining are available in Maracay. The coast of the country has beautiful beaches that are considered some of the best in the world for scuba diving and snorkeling.

"Also, the countryside is very historic and offers a variety of scenery," Noyes said. "From the beaches to the jungle, through the flat plains, up the Andes Mountains and through the big cities, there are many things to see."

The General Dynamics representatives said Venezuelans, as a rule, have been friendly hosts. "They live according to old traditions, with strong family ties," Noyes said. "They are a patient people, which is helpful to us when we encounter difficulties in trying to use their Spanish language."

For the American residents, one major adjustment is learning to live at a pace that is noticeably slower than the lifestyle in U.S. cities. "Venezuelans have learned to 'smell the roses,' and I sometimes think that Americans should take a few lessons from them," Noyes said.



**Company Representatives in Venezuela.** Fort Worth employees John Trevino, David Galloway, Lee Noyes and Ken Faires (left to right) are shown with an F-16 of the Venezuelan Air Force.

Driving an automobile in Venezuela and learning the particular rules of the road have been other major adjustments. For example, all cars in Venezuela are equipped with a device that causes a .35-second delay in the engine's response to acceleration. "That can be frustrating, especially when you're waiting at a traffic light that doesn't stay green very long," Noyes said.

Venezuela's economy is at a low point because it depends on oil production. There are restrictions on imports, and the country is beginning to produce many items that were imported. Many foreign companies are aiding Venezuela in its endeavor to become self-sufficient.

In their jobs in Venezuela, the General Dynamics employees work with the officers and enlisted personnel of Venezuelan Air Force Group Sixteen at El Libertador Air Base.

"The FAV (Fuerza Aerea Venezolana) personnel work very hard and they enjoy maintaining the sophisticated aircraft they now possess," Noyes said. "These men and

women are setting the pace for the rest of the FAV, and it is great being on a winning team."

The FAV is understandably proud that it is the only air force in South America with the F-16 in its inventory, he said.

The Product Support section of Fort Worth's Logistics and Support Department assigns technical representatives, under contract, to F-16 operating bases according to each base's particular needs, said Don M. Tye, the division's Manager of Field Product Support. The representatives remain at the bases as long as the customer desires their assistance. They primarily provide training and assist in solving technical problems. The representatives are eventually withdrawn as the bases become well-established in operating and maintaining the F-16.

More than 150 Fort Worth Product Support employees are assigned at F-16 operating bases in more than a dozen countries, Tye said.

## Pomona's Arlys Kovach Is a Good Name to Know in Weightlifting By Larry Elwell

Weightlifting is a sport that has the image of separating the men from the boys as competitors endeavor to heave 400 to 500 pounds of steel over their heads in pursuit of a gold medal.

The sport has immortalized people like Vassilii Alekseev, the man who held the most world records with 79 marks, Yuri Vardanyan, with 42 records and Arlys Kovach.

Arlys Kovach?

She holds all three American records for her weight class with 226 pounds in the clean and jerk, 187 in the snatch and 407 for the combined weight total.

She was team co-captain at the first Women's World Championship in Daytona Beach, Fla. She won the first gold medal for the United States in 17 years and set a world record with 176 pounds in the snatch competition.

She won a gold medal at the first Women's International Weightlifting Championship in Budapest, Hungary, in 1986 and won again in 1987. She also was the first American to win the International Pannonia Cup for all-around best lifter at the meet.

She is also a manufacturing analyst at Pomona.

Kovach has always been an all-around athlete. She competed in track and field, was a marathon runner and a power lifter. However, a motorcycle accident shattered her right leg and ankle in 12 places and left her in a cast for 18 months. Doctors said the best she could hope for was walking without a cane.

The accident ended her track and field efforts at Arizona State University, but she never accepted defeat from the accident. "The doctors gave me the confidence to save my leg," she said.

"I could have gone home to Minnesota, but I couldn't give up. The accident made me realize that what I apply to sports I can apply to the rest of my life," she said.

Kovach took her determination and decided to apply it to her education. Previously, her grades had suffered because of the amount of time she spent lifting weights and practicing with the track team. Better grades emerged as her new goal when her athletic endeavors were taken away.

"After those pins were drilled in my leg I went out and bought a huge backpack for my books and decided to get

an academic scholarship," she said. "And I did."

Weightlifting was an integral part of the ASU track program. Kovach used her experience with the team and from power lifting to rehabilitate her leg.

"I started lifting weights when my leg was little more than a bone," she said. "I couldn't wait to start again. I went to a gym across the street from school and worked out for about an hour and a half."

"I left the gym in tears because I had an unexplainable pain in my back and I couldn't finish even a light workout. I was afraid I wouldn't be able to perform again," she said.

Kovach went to see the team doctor at ASU and he observed that her right leg was more than an inch shorter than her left.

"He sent me to an orthopedist who gave me an insert



**World Champion Arlys Kovach Pauses After a Workout**

for my shoe and I began making progress in my workouts. Since I was starting over, my progress was limited to about five pounds a week, but it was great because I felt like an athlete again," she commented.

"It's difficult for me to believe in destiny, but I took a bad accident and made it positive," she said.

Kovach's husband, John, who started her on the rehabilitative road back from her injury, also played a large part in Kovach's entrance into the sport. He was an NCAA champion weightlifter in 1976.

The move to Olympic-style lifting was easy for Kovach. The new style allowed her to compete in a category close to her natural weight, which meant she did not have to gain or lose weight to qualify.

She competed in her first meet in 1985 and later again in Hawaii where she met one of her present coaches, Tommy Kono.

"Tommy says I have as much potential as anyone on the U.S. women's team. He said with quality training I should be able to do things never imagined," she said.

According to Kovach, her coach has set world-class goals for her. He would like to see her lift 198 pounds in the snatch and 242 pounds in the clean and jerk. Kono ultimately wants Kovach to be the heaviest woman to lift double her body weight.

"I compete at 148 pounds and to clean and jerk double body weight is more difficult for the competitors in the higher weight classes," she said. But Kovach believes she can attain her goals with the help of her coaches.

Kovach's chosen sport is not yet an Olympic event. The International Olympic Committee will vote on the matter this year, she said. However, even if the IOC vote is favorable, the sport will not be incorporated into the Olympics until 1992 or 1996.

Kovach plans to compete even if it is eight years until the sport is placed on the Olympic schedule.

Division support for Kovach is evident throughout her department. She noted that Mike Olivieri, Director of Electronic Fabrication, has taken photos to staff meetings and has related athletic goals to work goals.

"I feel really special to get this support from the division," said Kovach. "I appreciate the schedule arrangements I can make when I have a competition."



## Promotions to Vice President Made at Corporate Office and Fort Worth

Promotions to Vice President have been announced by the Corporate Office and Fort Worth Division.

**Kent Druyvesteyn** has been appointed Staff Vice President-Ethics Program at the Corporate Office.

"This important organizational change reflects the continuing significance of our Ethics Program commitments to our customers, our suppliers, our employees, our shareholders and to the communities of which we are a member," Chairman and Chief Executive Officer Stanley C. Pace said. "Under Kent's direction, the corporation's Ethics Program has become one of the finest and most emulated programs of its type in American industry and is frequently referred to as a model by our customers."

Prior to joining General Dynamics as Corporate Ethics Program Director in October 1985, Druyvesteyn was Director of the M.B.A. Program and Dean of Students for the Graduate School of Business at the University of Chicago. Previously, he was Assistant Dean at the M.J. Neeley School of Business at Texas Christian University, where he started the development of a master's level course in corporate ethics and taught on the faculty of the School of Business. He holds a bachelor's degree in history from Calvin College in Grand Rapids, Mich., and a master's degree and a doctorate in social and intellectual history from the University of Chicago. He also taught at the University of Richmond and the College of William and Mary.

**James R. Goodman** has been appointed Division Vice President - F-III Programs at Fort Worth. He previously was Director of Electronic Products at the division. Goodman joined General Dynamics in 1956 and spent 10 years in electronics and avionics design for the B-58 and F-III aircraft. He later served as a Chief Project Engineer on F-III programs, and in 1975 was named Manager of Advanced Electronic Programs. He managed the RF-III C



Druyvesteyn



Goodman



Vick



Zimmerman

and F-16 programs for Australia and served as Manager of Aerospace Equipment with responsibilities relative to the F-16 and F-III. He holds a Bachelor of Science degree in Electrical Engineering from Oklahoma State University.

**John E. Vick** has been appointed Division Vice President-Electronic Products at Fort Worth. He previously was Director of Support Requirements and Systems in the Engineering Department. Vick joined the company at Fort Worth in 1959 in the aerospace physics group of Research and Engineering and held assignments as Senior, Project and Group Aerosystems Engineer and Assistant Project Engineer. He was assigned responsibility for the division's Electronic Fabrication Center (EFC) in 1973 as an aerosystems group engineer and later served as Chief and Manager of the EFC. He was named Director of Support Requirements and Systems in 1980. He holds bachelor's and master's degrees in electrical engineering from Texas A&M University.

**W.B. "Zim" Zimmerman** has been appointed Division

Vice President-Logistics and Support at Fort Worth. He previously served as Program Director - F-16 Turkey. Zimmerman joined the company at Fort Worth in 1964 as a member of the F-III Liaison Engineering group. He held various engineering positions, including Flight Test Engineer on the F-III and YF-16 programs. He was on special assignment to coordinate the debut of the F-16 at the 1975 and 1977 Paris Air Shows. He joined Logistics and Support in 1978 after a brief assignment in Marketing and was later named Director of Product Support. He was assigned to the Turkish program in 1984. Zimmerman holds a Bachelor of Science degree in Aeronautical Engineering from Texas A&M University.

Goodman succeeds Dr. George L. Davis, who has been appointed Division Vice President-Combined Arms Systems Engineering. Vick replaces Goodman as head of the electronics department, and Zimmerman succeeds Rolf Krueger, who has been appointed Division Vice President-Resource Management.

## New Initiative Aims at Major Changes in How Company Does Business

Executives from General Dynamics' major defense divisions met recently to kick off the Variability Reduction Program (VRP), a corporatewide initiative that has unlimited potential for reducing costs and improving product quality.

Herbert F. Rogers, President and Chief Operating Officer, described the program as "a major change in the way we do business" and "the start of something that can be very exciting for this corporation."

The company's VRP was inspired, in part, by the U.S. Air Force's Reliability and Maintainability (R&M) 2000 program, a broad-based effort to improve operational performance and lower procurement and in-service costs of weapons systems. Variability Reduction also applies to defense products supplied to the U.S. Navy and U.S. Army.

"This program spans the product range from Trident and 688-class submarines at Electric Boat on the East Coast to shoulder-fired Stingers on the West Coast and everything in between," Rogers said. "Every one of our products has the same fundamental characteristics, and every one of the services that we do business with has the same characteristics."

"The question is how can we all do a whole lot better job than what we are currently doing. Some of our products are recognized as the best in the world . . . but we still need to make them better," Rogers said.

VRP comprises three major elements that will be used to ensure the quality and cost effectiveness of products from development and design through production, and for years later in their use in the field.

VRP's major elements are Statistical Process Control; the Taguchi Method, a mathematical process of design analysis and experimentation that has been used successfully in Japan, where it is known as "Quality Engineering;" and Quality Function Deployment, an analytical process for determining customer requirements of a proposed product design.

At the meeting held in Fort Worth, engineering, material, production, quality assurance and logistics department executives from throughout the company were introduced to the VRP concept during a day-long seminar.

B. Edward Ewing, Corporate Vice President-Operations, said, "We (at General Dynamics) realize that things are changing, and that we need to change our culture and the way we think."

Ewing explained that the VRP elements will provide "financial tools to show us areas of cost opportunity." These tools can be used to determine the optimum design elements for a product and the optimum processes to be used in manufacturing it, he said.

The ultimate goal of the VRP effort is to reduce product variances that result in scrap and rework in production and in reliability and maintainability problems in the field.

Rogers said Variability Reduction will allow the company to introduce an "end-to-end" process to affect the total task of designing products, building tooling for production, procuring supplier-produced parts, manufacturing products and supporting products after delivery. Fort Worth has been selected to implement pilot VRP projects, he said.

Employees representing all of Fort Worth's major functional departments were present at the kickoff seminar.

The concept will be applied to certain aspects of the F-16 program already in production and to development of the Advanced Tactical Fighter (ATF) and Advanced Tactical Aircraft (ATA). "I can't think of a better time to start this than at the front end of these new programs," Rogers said.

With traditional methods of design and manufacturing, the true cost of scrap and rework that is caused by product variances has remained unknown, Rogers said. "No (company) division understands the impact that 'not doing it right the first time' has on their product cost," he said. "We are starting a process that can make a tremendous dent in that cost."

U.S. commercial industry has already begun to apply some of the principles of the VRP concept, particularly in producing automobiles, Rogers noted.

Over the next few months, each division of General Dynamics will establish a team of employees to plan the use of VRP in its programs. An outside nonprofit agency, the American Supplier Institute, will work with the company in introducing the Taguchi Method and other techniques.

Variability Reduction is an important part of the company's efforts to become more competitive in cost and quality, Rogers said. "In the business we're in, the name of the game now is competition," he said.

## Launching Submarines and Careers Blend In Award-Winning Slide-Show Project

By Graham Gavert

A combined effort by several Electric Boat departments pushed a three-projector slide-show production into the winner's circle recently at a competition sponsored by the New England Chapter of the Association for Multi-Image.

Winning in the category of "Public Relations/Image" for profit organizations, the production titled "Launch" involved the skills and talents of employees from the Security, Human Resources, Communication Services, Photography, Engineering and Operations departments. All worked in cooperation with an outside vendor, Thompson Associates of South Windsor, Conn.

According to David Tela, Supervisor of Communication Services, to whom the award was presented, "Launch" began as a request from the Professional Staffing Office for a new slide show to be used by college recruiters. Blending the idea of launching a submarine with launching one's career, the project is intended to attract talented individuals to Electric Boat's demanding work environ-

ment while conveying the atmosphere of the division so that potential new hires understand what it is like to be an employee at the division.

The program features Electric Boat employees who represent a wide variety of backgrounds working in a number of different environments. By avoiding the use of artificial settings or staged scenes, the program helps put Electric Boat in its proper context, showing a very credible and diverse place to work. A narrator who provided transitions between the employees featured in the slide-show was the only professional performing talent used in the production.

"The results of this team effort have spoken well for everyone involved," Tela said. "The reception that the program has received from viewers has exceeded all expectations. Obviously, a good cooperative effort speaks for itself. I think all who were involved are feeling a real sense of satisfaction because of this award."



**Production Crew Honored.** The award-winning team was made up of (seated, left and right) Lisa A. Marciano, Security, and Jackie M. Fisher, Human Resources, and (standing left to right) William H. Lillie III, Engineering; Gary A. Slater, Photography; David Tela, Communication Services; and Russ E. Anderson, Thompson Associates.



## Fort Worth's GIMADS Concept Seems Vague, But Only in Its Name

An interdisciplinary team led by a group of Fort Worth employees is using innovative design, documentation and management approaches in developing a model concept for Generic Integrated Maintenance Diagnostics (GIMADS).

The name GIMADS may seem a little vague, but the concept is anything but that. GIMADS is an important element in the U.S. Air Force's initiative to increase readiness and reduce support requirements through increased weapons system supportability, according to Richard H. Clothier, Fort Worth's GIMADS Program Manager.

"The results of the GIMADS program will have a major impact on the organization, design, procurement, integration, testing and deployment of future military systems," Clothier said.

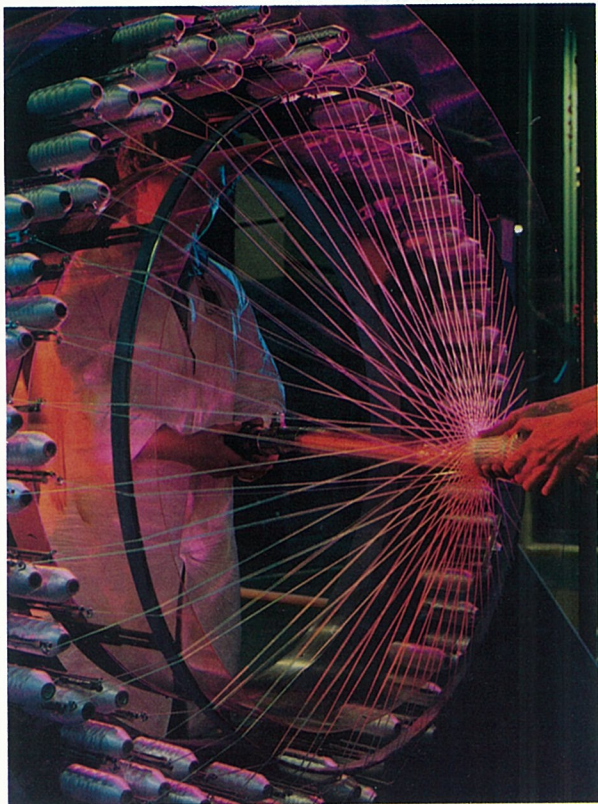
The team is investigating various technologies that can contribute to an integrated maintenance diagnostic capability for complex military equipment. It is charged with developing a generic diagnostic process and documenting its findings in standards, specifications and handbooks that can be tailored to a wide variety of Air Force systems, Clothier said.

The resulting handbooks will be used to guide government and industry program managers, as well as designers, in making diagnostics an integral part of the design and support phases of the military acquisitions process, he said.

David P. Parham, Fort Worth's GIMADS Technology Manager, said the program involves many current and developing technologies: very high speed integrated circuits (VHSIC), computer expert systems, test routines, diagnostics software, system architecture, modular approaches, automated procedures and automated test equipment.

"Equal emphasis is being placed on diagnostic technology for avionic, mechanical, structural, propulsion, electrical and power systems," he said.

The program is being carried out under a five-year, \$20 million Air Force contract. "To ensure a generic approach, Fort Worth's expertise is being complemented by eight subcontractors," Clothier said. General Dynamics Electronics Division is one of the eight. The others are Hughes, TRW, Bell Helicopter Textron, General Electric, Rockwell International, Giordano Associates and Marcon Industries.

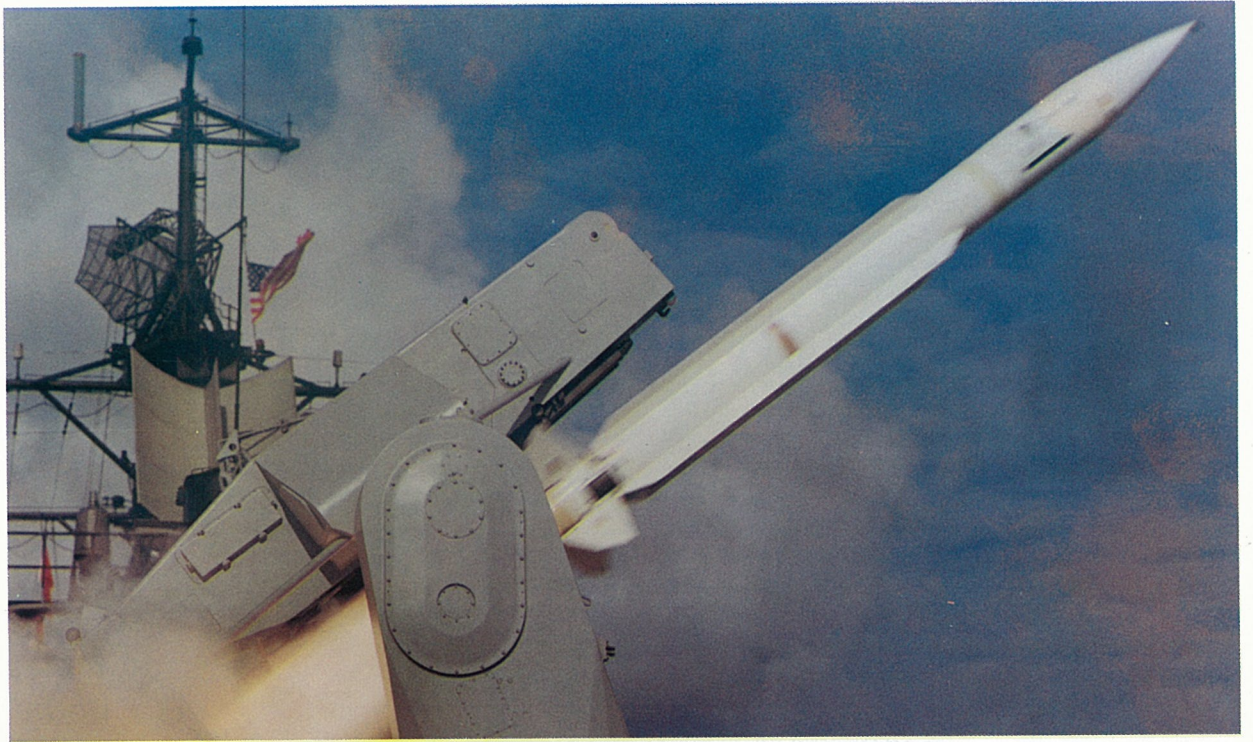


**New Twist on Braiding.** An automatic braiding machine at Fort Worth spins a shell of fiberglass yarn on part of an engine air duct for company-built F-16 fighters. After curing, the braided material provides a high-temperature composite insulation jacket for ducts on the aircraft's 2600-degree Fahrenheit engine.

## Mellor Heads Ship Board

James R. Mellor, Executive Vice President-Marine, Land Systems and International, has been elected Chairman of the Board of the Shipbuilders Council of America for 1988.

He succeeds Hans K. Schaefer, President of Todd Shipyards Corporation.



A Pomona-Built Tartar Missile Is Fired from a U.S. Navy Ship

## GD Flashback

### Pomona 'Thought Small' With Its Tartar By Dave Lange

Warships are designed to obtain the best balance of speed, armament and maneuverability. Surface fighting vessels are narrow and packed from stem to stern with equipment. Every shipboard inch is valuable.

"Not only is internal space at a premium but so also is deck space," wrote Capt. John E. Moore of the British Royal Navy in the foreword to the 1987-88 edition of Jane's Fighting Ships. "Missile and gun mountings, radar, communications and ECM (electronic countermeasures) equipment all need not only physical acreage but must have sufficient separation to avoid electronic interference."

It was in this quest for the most efficient use of deck space that the Tartar anti-aircraft missile was born in the mid-1950s. The U.S. Navy, pleased with the performance of Pomona Division's Terrier anti-aircraft missile that went into volume production in 1953, wanted a smaller version of the 27-foot-long missile that would fit in the close confines of destroyers and other small vessels.

Asked to think small, Pomona engineers came up with a 15-foot missile that was more than just a little brother of the Terrier. Their creation proved to be so effective that the missile was named Tartar, defined by Webster's as "one that proves to be unexpectedly formidable."

The Tartar incorporated a number of features, and, although it went out of production in 1968, a few Tartars remain with the U.S. and allied navies. Tartar's successor is the Standard Missile currently made at Pomona. The Tartar concept has been carried on with the development of the Standard Missile. The Tartar version of the Standard Missile 2T (Terrier/Tartar) has begun to be installed on Navy ships with Tartar fire control capabilities.

Tartar development began at Pomona in 1955. In the years that passed until production started, Pomona worked in a number of improvements over the Terrier. They included a dual-thrust rocket motor, a semiactive homing system and easy-to-maintain electronic components.

The Tartar's single motor eliminates the need for Terrier's separate booster and cruise motors by providing getaway speed upon firing and sustained speed for cruising to a target. The combination of two thrust profiles into one motor accounts mostly for Tartar's size reduction. The homing system permitted Tartar to be guided by signals bounced off the target, rather than by the early Terrier method of riding a radar beam aimed by a friendly source at the target. Electronics are contained in five wheels in Tartar's forward section; a malfunctioning wheel is simply replaced with a new wheel to eliminate the need for repairs aboard ship.

Another plus on a cramped destroyer is that Tartar's tail fins fold down during storage and automatically pop into position when loaded into a launcher.

When Tartar development began, Adm. John H. Sides described it as "small enough to go into destroyers and the secondary batteries of larger ships, yet has more performance than the original Terrier. It can replace five-inch guns."

The Tartar turned out to be everything the admiral wanted. Its compactness and improvements came without sacrificing performance. Like Terrier, Tartar has a range of over 10 miles. It flies at three times the speed of sound and can reach an altitude of 40,000 feet. It uses a launcher magazine and handling and loading system that are automatic.

Three stages marked the evolution of the Tartar. The first was the basic missile designed for destroyers. The second, the Improved Tartar, incorporated semiactive homing guidance and used a solid propellant. The third, and the version of Tartar still aboard a few U.S. Navy ships, is the Improved Tartar Retrofit and features multiple target and surface-to-surface capabilities, electronic countermeasures and some solid-state devices.

Since Tartar's introduction on board the destroyer USS *Charles F. Adams* when that ship was commissioned in September 1960, Tartar has been installed on U.S. Navy cruisers, destroyers and frigates as a primary or secondary anti-aircraft weapon. In fact, the Navy designed a new class of destroyer, of which the *Adams* was the first, for the Tartar.

Tartar's first use by an allied navy came aboard Italy's *Impavido*, a destroyer commissioned in November 1960. The navies of Australia, France, West Germany, Japan, the Netherlands and Spain also use the Tartar system.

## Valley Systems Gets First Multiyear Contract

Valley Systems Division has been awarded its first multiyear contract for approximately 19,500 Stinger-RMP (Reprogrammable Microprocessor) rounds to the U.S. Army Missile Command (MICOM) through 1991.

The Army can exercise an option by April 30th for an additional 1,050 rounds that would increase the value of the contract from \$665 million to \$695 million.

William M. Leonard, Division Vice President and Program Director-Stinger Weapon Systems, called the multiyear contract a "milestone" for the division and said it "was truly a companywide effort and a tribute to the fine men and women of General Dynamics and the many U.S. Government agencies that have been supporting the Stinger program."

He said that the division's "superior production and engineering performance on Stinger-POST (Passive Optical Seeker Technique) and now on Stinger-RMP has allowed such a significant effort as the Stinger multiyear program to be executed."

The division is producing Stinger-RMP under three

contracts, all from MICOM. When these contracts are added to the multiyear contract, Valley Systems will be producing more than 27,000 missile rounds into 1991.

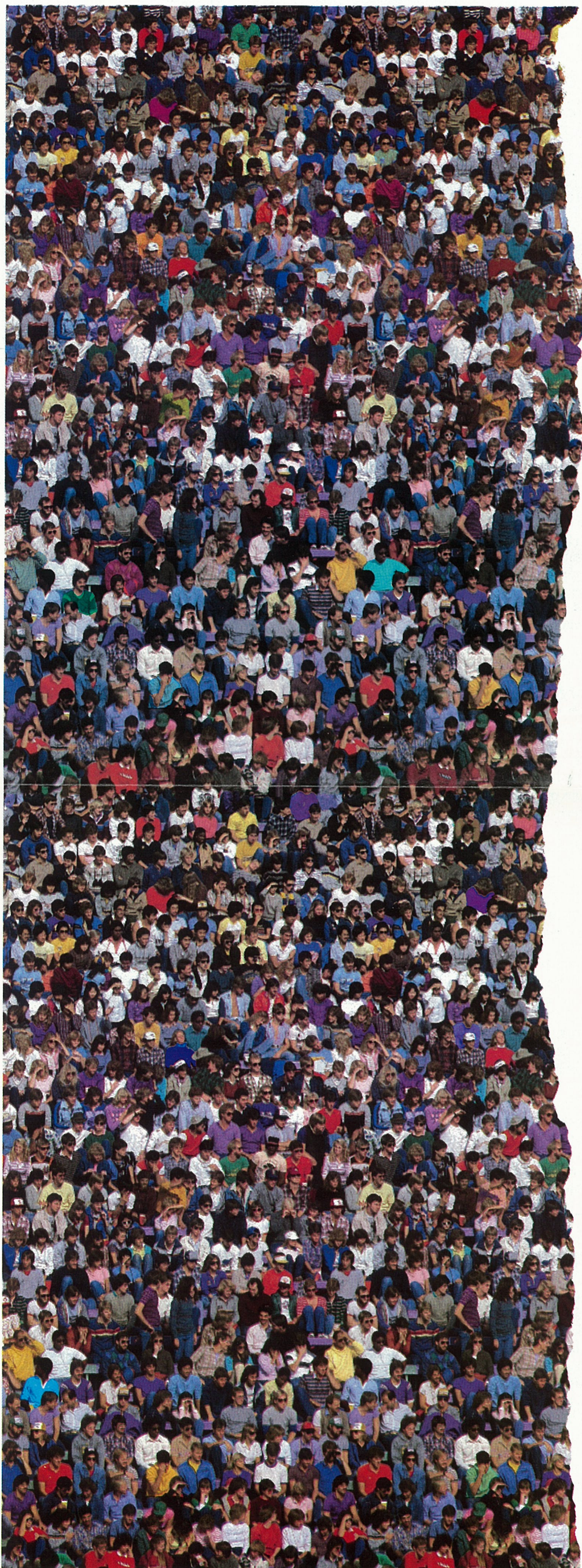
Since the awarding of the first basic Stinger production contract to General Dynamics by MICOM in 1978, more than 16,000 rounds plus training sets and spares have been produced, including the rounds produced when the Valley Systems site was operated by the Pomona Division.

Stinger is the premier man-portable, shoulder-fired, forward area air defense system in the world. It allows the user to provide immediate air defense at or near the forward edge of the battle area.

Stinger's light weight and maintenance-free design make it ideally suited for highly mobile military services. It is deployed with all branches of the U.S. armed forces and in several foreign countries.

The weapon system continues to demonstrate exceptional accuracy and reliability during in-service firings against a variety of high-performance targets.





## A GOVERNMENT OF HALF THE PEOPLE, BY HALF THE PEOPLE, AND FOR HALF THE PEOPLE.

The quote isn't accurate. But the numbers are.

In the last Presidential election, only 53% of those eligible actually voted.

The problem is worst among the youngest voters, the 18-to-24-year-old group. Less than half of them even register. Only 17% actually voted in 1986.

This shocking statistic prompted us to make a commitment to the Vote America Project.

Together, we are providing teaching materials to 25,000 high schools. And personal registration and voting booklets to over a half-million voting-age students. Our goal: to register every one of them. And to urge them all to become informed voters.

We're running a national TV campaign to encourage older voters, too.

Because when a government is *of* half the people and *by* half the people, sooner or later the worst thing happens. It becomes *for* half the people.

And no American would vote for that.

**GENERAL DYNAMICS**  
A Strong Company For A Strong Country



## Company Conducting Nationwide Campaign To Get Out the Vote

General Dynamics has mounted a major campaign to get 18- to 24-year-olds to register and vote in the coming presidential election.

The company is conducting a public service vote awareness program, much of it in cooperation with Vote America, the national nonprofit organization concerned with voter apathy. The company also is conducting an internal communications program to reach employees.

Vote America, which is aiming its vote awareness program at three classes — new citizens, the traveling public and 18- to 24-year-olds — estimates that the highest percentage of nonvoters is in the last category. Of the 26 million 18- to 24-year-olds in the country, 63 percent of them probably won't vote in 1988, Vote America said.

Central to the company's external program was a \$75,000 grant last year to the Vote America Foundation for the specific purpose of reaching seniors, mostly in the 18-20 age group, in virtually all of the country's high schools in a voter education curriculum and classroom project.

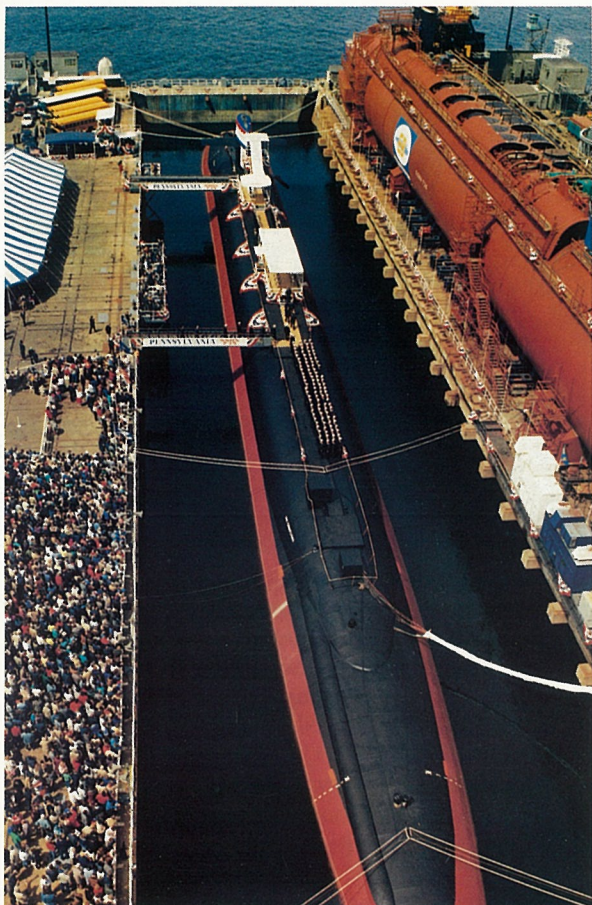
(Continued on Page 4)

### Readers' Survey

The Public Affairs Department is dedicated to publishing the best possible company newspaper for the 106,000 employees of General Dynamics.

In order that the monthly newspaper provide interesting and informative coverage of company matters, we are seeking readers' views on what they would like to see, and maybe not see, in *General Dynamics World*.

A special questionnaire will be included in the June issue of the newspaper that will ask employees' opinions on a number of points regarding format, content and makeup of *General Dynamics World*. Watch for it in next month's issue!



**Trident Christened.** The 560-foot-long Trident submarine *Pennsylvania* floats in the land level graving dock at Electric Boat's yard at Groton, Conn., during her christening April 23rd. The *Pennsylvania* is the 10th of her class to be christened. (See related story on Page 10.)

## Space Systems Wins Air Force Competition For the Medium Launch Vehicle II Program

Space Systems has been selected by the U.S. Air Force to build a new fleet of expendable launch vehicles (ELVs) for its Medium Launch Vehicle-II program.

The announcement was made by Secretary of the Air Force Edward C. Aldridge Jr. on May 3rd at the American Institute of Aeronautics and Astronautics conference in Washington, D.C.

"Full restoration of our ELV production base is a key element for the future of our national security and our civil and commercial space programs," Aldridge said. "We must continue to build that production base by assured access to space, step by step, and I'm pleased that the Air Force has taken the lead in that role. Today, I'm very proud to take another step in that direction by announcing the winner of the Medium Launch Vehicle II competition."

The MLV award is for 11 launch vehicles, which will be designated Atlas II. Beginning with the first launch in 1991, Atlas II will launch 10 Defense Satellite Communication Systems payloads and a Space Test Program satellite over seven years. The program has the potential for up to 20 additional vehicles. Details of the winning contract will be announced by the Air Force as soon as Congress releases the funds already appropriated, Aldridge said.

"This is a significant win for our division that assures the continued use of the company's reliable launch vehicles well into the next decade," said Dr. Alan M. Lovelace, Vice President and Space Systems General Manager. "We look forward to working closely with the Air Force on this very important program, and we are confident that Atlas II, in this new role, will continue to demonstrate the outstanding record of reliability and success achieved during the 67 Atlas/Centaur launches since 1962."

Atlas II will add a low-cost advanced avionics system and flight computer to the Atlas/Centaur. Atlas II will also have increased booster engine thrust and stretched propellant tanks. It will have the capability of boosting nearly 6,100 pounds of payload to geosynchronous transfer orbit. Present plans call for the Air Force to launch the MLV II from Complex 36A at Cape Canaveral, Fla.

Production work will take place at the Space Systems facilities in San Diego. Additional work will be done at Western Space and Missile Center at Vandenberg AFB, Calif., Eastern Space and Missile Center, Cape Canaveral, Fla., and the General Dynamics Services Company's facilities in Harlingen, Tex.

Last year, the company announced that Space Systems



Atlas II to Launch 11 USAF Satellites

would build 18 Atlas/Centaur launch vehicles for the commercial market, now designated Atlas I. Present plans call for building Atlas Is and IIs at a rate of eight per year in addition to four Centaur upper stages for the Titan/Centaur program. Concurrent with the development of the Atlas II for the Air Force, Space Systems will develop an Atlas IIA offering performance and payload volume suitable for most commercial missions through the 1990s.

Space Systems has four firm commercial orders for Atlas I and four more options. The division expects to announce other firm orders and additional options later this year.

## General Dynamics Is Responding to Changes In Defense Business Environment, Pace Says

General Dynamics is responding to the changing defense industry environment with measures that will keep the company on a sound course for success in the future, said Chairman Stanley C. Pace, in his remarks at the annual meeting of shareholders May 4th in Fort Worth.

"During the past year, our management team and our people have made much progress in understanding and adapting to this new environment through cost reduction," Pace said. "Future success will have to be earned, and we are dedicated to that task."

Pace said General Dynamics has gained "a unique position among the leading U.S. defense contractors" for a variety of reasons.

"Our mix of defense systems, from those in early development to those in mature production, is of critical importance to each of the three U.S. armed services," he said. "As a result, our programs are not expected to bear the brunt of budget cutbacks."

"Also, many of our products are especially well suited

for evolutionary upgrades of their capabilities.

"Further, we are participating only in those new-start programs that are vital to our customer . . . and for which General Dynamics has a technical expertise and a competitive position in the industry."

With these factors, plus adequate cash flow for the development of new products, the company has an excellent opportunity to strengthen its industry leadership in the new military procurement environment, Pace said.

"We will continue excellence in all administrative areas and become increasingly aggressive in our cost reduction efforts," he said.

Pace reported that the company had record sales and earnings and a record order backlog for 1987.

After introducing current members of the Board of Directors, he recognized the contributions of former Board members Oliver C. Boileau and Albert E. Jenner Jr. "We are grateful to them for their many years of service and

(Continued on Page 2)

## Variants of Navy Tomahawk Cruise Missiles Fly Four Successful Test Flights in April

U.S. Navy Tomahawk cruise missiles flew four successful test flights in April, including the first dual-salvo launch of the antiship variant, the first night flight of the land-attack variant and the eighth flight test of the submunitions dispensing missile. All variants are now in production at Convair.

On April 21st, two Tomahawk antiship missiles were launched off the coast of California from the same ship. Both missiles flew typical antiship missions against a single target and were recovered after target overflight on San Clemente Island.

A conventional land-attack Tomahawk was launched

off the coast of California on April 24th and flew inland to the Naval Weapons Center test range at China Lake, Calif., where it successfully overflew a simulated target after sundown. The missile was recovered after a flight of approximately 1½ hours.

On April 9th, a Tomahawk land-attack missile equipped with a submunitions dispenser carrying inert combined effects bomblets was launched from a surface ship under way in the Pacific Missile Test Center range. The missile engaged three targets and then performed a terminal dive into a fourth target. Initial operating capability of the submunitions version is scheduled for this fall.





**Nautilus Remembered.** Electric Boat presents ceremonial items, including the electrode and electrode holder of the U.S.S. *Nautilus*, to the Nautilus Memorial Museum at Groton, Conn. From left to right: Lieut. Cdr. Dale R. Immel, Officer-in-Charge; Rear Adm. David B. Bell, Museum Association President; and Henry J. Nardone, Electric Boat Trident Program Manager. A witness to the launch of the nuclear-powered *Nautilus*, Nardone rode the ship as she slid down the ways. The electrode and electrode holder were used by President Harry S. Truman to weld his initials into the ship's keel in 1952.

## Fort Worth Service Library Named the Best In Nation for U.S. Air Force Technical Orders

The employees who operate Fort Worth's Service Library and Data Depository were honored recently for their outstanding performance — including contributions to ensuring a high level of security at the division — during the last two years.

Review teams from the U.S. Air Force Aeronautical Systems Division recognized Fort Worth's Service Library as the Most Outstanding Technical Order Library in the Nation in 1986 and 1987.

The library received high ratings in security inspections by the U.S. Defense Investigative Service in 1987 and earlier this year. Linda L. Hudson, Service Library Supervisor, twice was commended by government security inspectors for her "outstanding security awareness and knowledge of procedures." Hudson was mentioned in official inspection reports.

In addition, the Service Library staff has received frequent commendation letters from the many division departments that it supports.

Rolf Krueger, Division Vice President-Resource Management, congratulated the 26 library employees during a luncheon in their honor. The Service Library is part of the Office Services organization of Resource Management at Fort Worth.

The library maintains approximately 300,000 documents consisting of company data, vendor data and tech-

nical orders, which are Air Force technical manuals for the F-16 and F-111. The material includes government classified documents.



**Outstanding Technical Library.** Rolf Krueger, Fort Worth Vice President - Resource Management, congratulates Service Library supervisor Linda Hudson for the many honors earned by the library staff in recent years.

## Challenges Being Met in Changing Business Environment, Pace Says

(Continued from Page 1)

wish them well in the years ahead," he said.

General Dynamics on April 20th reported first quarter 1988 net earnings of \$105.7 million, up slightly from \$105.4 million in 1987; earnings per share increased to \$2.52 from \$2.45 for the same period last year. Sales rose to \$2.4 billion from \$2.25 billion, up 6.7 percent over last year's first quarter.

Net earnings for the 1988 first quarter reflect benefits of \$20 million, or 48 cents per share, from tax law changes resulting in reductions of deferred taxes. Comparable benefits for the 1987 first quarter were \$20 million, or 46 cents per share.

"Increased procurement on the F-16 program resulted in an overall improvement in the Government Aerospace segment," said Pace, "despite continued investments in advanced aircraft programs and lower production of the Ground Launched Cruise Missile as that contract nears its scheduled completion during 1988."

Results of the company's submarine operations reflect

increased production activity on the Trident program. Pace also noted that the company had reached a satisfactory agreement in principle with the Navy for recovery of costs associated with design changes to incorporate a new combat system in SSN 688 submarines. *San Juan*, the first ship equipped with the new system, is on sea trials and "performing very successfully," he said.

Pace said that Cessna remained profitable this quarter as a result of continued cost containment efforts. In other lines of nondefense business, he said the company continued to invest in production of 18 Atlas-Centaur launch vehicles. "We are confident that this commitment is sound," he said, noting that "our customers permit us to disclose that we hold four firm orders and an additional four options."

Backlog reached a record high, with funded backlog at \$17.3 billion and total backlog (funded and unfunded) at \$24.9 billion. Comparable amounts in 1987 were \$15.7 billion and \$21.7 billion. The 1988 backlog includes recent competitively won contract awards for development of the

U.S. Navy's Advanced Tactical Aircraft, construction of the 15th Trident submarine, and the majority of Fiscal Year 1988 procurements of Standard and Sparrow missiles, as well as a multiyear contract for the Stinger missile.

"The first multiyear contract for production of Stinger is particularly significant," Pace said. "Stinger joins the F-16 aircraft and the M1 tank as the third major General Dynamics weapon system now in multiyear procurement. These three long-term contracts amount to more than 35 percent of total corporate sales and provide a very stable business environment for the company and its subcontractors — allowing us to increase investments in new technologies and to attract and retain skilled employees. Moreover, multiyear procurement has proven to be a cost-effective means for the government to acquire weapon systems."

"General Dynamics' products remain a critical part of the nation's military strategy," Pace said. "Our broad-based programs and substantial backlog will provide continued stable earnings in the face of a flat or declining defense budget."

## Royal Australian Air Force Presents High Award to Willard B. Bennett

The Royal Australian Air Force recently presented one of its highest awards, a Chief of the Air Staff Commendation, to Fort Worth employee Willard B. Bennett, who provides engineering support for the RAAF's F-111C program.

Bennett's commendation is believed to be the first such honor bestowed on anyone outside the military service or the Australian defense organization, said RAAF Wing Commander Norm R. Watt, Australia's Technical Liaison Officer at the Sacramento Air Logistics Center, McClellan AFB, Calif.

The commendation thanks Bennett, a senior project engineer, for technical assistance he has provided to the RAAF over a period of 20 years. It is signed by RAAF Air Marshal Ray G. Funnell, Australia's counterpart to the Chief of Staff of the U.S. Air Force.

In the commendation, Air Marshal Funnell said Bennett has "provided exceptional service" with assistance and advice that "has always exceeded any contractual obligation and significantly contributed to the success (of the F-111C fleet in Australia)."

"Your personal integrity and professional standards are of the highest order and reflect great credit upon yourself and the General Dynamics Corporation," the Air Marshal said to Bennett.

The commendation was presented to Bennett in Fort Worth by RAAF Group Capt. Ray L. Perry, Assistant Air Attache at the Australian Embassy in Washington, D.C., and Wing Commander Watt. In addition, Wing Commander Watt presented a book, "History of the Royal Australian Air Force," to Bennett on behalf of the RAAF liaison officers with whom the employee has been associated.

Bennett joined General Dynamics in 1950. He has been working with the RAAF on the F-111C program since early 1968. He has overall engineering project office responsibility for the F-111C and RF-111C, the reconnaissance version of the aircraft.

The presentation was set up as a surprise to Bennett. "I was quite flattered," he said later. "It makes you feel good when the customer gives you that kind of recognition."



**RAAF History.** Fort Worth employee Willard Bennett (center) looks through history book on the Royal Australian Air Force with RAAF Group Capt. Ray Perry (left) and Wing Commander Norm Watt. Bennett recently received an RAAF Air Marshal's Commendation for his service to Australia on the F-111C program.

## Camden Produces Its 5,000th Sparrow Missile Ahead of Contract Schedule

Pomona's Camden Operations recently produced its 5,000th Sparrow Missile. The missile rolled off the assembly line ahead of contract schedule, as all previous missiles have done for the past 24 months.

The 5,000th Sparrow marked another milestone for the

facility. Earlier this year, the Navy awarded Camden 1,444 missiles — which represents 70 percent — of the Fiscal Year '88 procurement contract. This was the first time the facility won a majority of the annual competitive Sparrow production award.

Although the Sparrow missile continues to be the prime program for Camden Operations, new and diversified manufacturing opportunities are being sought to assure the facility's continued growth.



# Current & Comment

*(Observations on news of interest to the company and the industry will appear regularly in this column.)*

**FOR THE RECORD** - Anyone who missed *Fortune* magazine's recent cover story on "What America Makes Best" can now find it in the Congressional Record. The listing of the 100 best made products in

\* \* \*

**GRAD PREFERENCES** - Recently reported results of a privately-sponsored survey among nearly 2,000 engineering students at 274 U.S. colleges and universities rank General Dynamics as the tenth choice among 100 prospective employers. Mechanical engineering students ranked GD as their No. 3 choice; astronautical/aeronautical engineers rated GD as No. 7. Nearly

\* \* \*

**WALK, DON'T RUN** - GD's most popular employee entry in the recent 18-mile "Walk America" fund-raiser in San Diego was Sue Stoffel, a Material Analyst at Space Systems. Sporting 172 sponsors, Sue took in \$61+ per mile — a personal earnings of more than \$1,100 for the March of Dimes. An 11-year GD

\* \* \*

**IT'S EASY IF YOU KNOW HOW** - With an estimate that came within .03 of the closing Dec. 31 '87 Dow Jones Industrial Average (1938.83), GD Pomona/Camden accountant Scott Garwood topped 5,008 other hopefuls to capture Cable News Network's MONEYLINE "Market Maven" Contest. In March, CNN flew winner Garwood to New York for an appearance on Lou Dobbs' MONEYLINE and dinner with other network journalists.

the U.S.A. — including the Fort Worth-built F-16 fighter — was documented for posterity in Vol. 134/No. 30 of the official proceedings and debates of the 100th Congress. Minnesota Senator Dave Durenberger, who offered the article on the Senate floor, wrote to Chairman Stanley C. Pace: "Congratulations, and keep up the good work."

60 percent of the 1,942 respondents cited nature of the work and technical reputation as the most important reasons for their selections. News reports about the company were noted as the most influential factor in the decisions made by half of those participating in the study.

employee, Sue called this long-distance stroll for the MOD (her third) "the absolute best." She and Greg Meister, husband of Convair employee Gina Meister, will both join the association's "top walker" club. Meister also collected more than \$1,100.

How did he do it? "Easy," joked the 24-year old MBA candidate. "I just multiplied the total number of contest entries (5,009) by my age, divided that by the number of days in December, and then took half."

Pressed for the truth, Scott said that he had plotted daily market movement for December 1986, taken the percentage decline and then projected it for 1987 — factoring in the October crash plus tax reforms.

## Company Endows Faculty Fellowship

The company has established a General Dynamics Endowed Faculty Fellowship in Aerospace Engineering at Texas A&M University, College Station, Tex.

The first of two installments of the \$75,000 gift was presented to Texas A&M President Frank E. Vandiver recently by Charles A. Anderson, Vice President and Fort Worth General Manager.

Anderson is a member of the College of Engineering External Advisory and Development Council at Texas A&M and a 1987 Distinguished Alumnus of the university.

The company's gift will be matched by the university, creating a total endowment of \$150,000 for the position. Income from the endowment will be used to provide funds for research and other professional expenses to a top faculty member in the Department of Aerospace Engineering, Anderson said. "I challenge other corporations to do their part to support the College of Engineering," he said.

"Thank you for the faith you have shown in our institution," said Vandiver. "I can assure you that we will continue to do our best to produce the type of graduates that you desire."



**GD Tops WalkAmerica Corporate Fund-raisers.** Division coordinators for the March of Dimes WalkAmerica in San Diego celebrate the successful 30 kilometer hike around Mission Bay in which General Dynamics employees raised more than \$56,000 — the largest pledge amount of any corporate supporter. Cal R. Samuels - Convair, Julie M. Lawrence - Space Systems, Paul W. Davis - Electronics and Pat A. Gayton - Convair signed up more than 700 walkers from General Dynamics. Amy Garfield - Convair Recreation Association and Karen A. Pritchard - Data Systems Division-Western Center (not shown) also helped coordinate participation.

## GLCM's Mission Accomplished With U.S.-Soviet INF Treaty By Julie C. Andrews

When the Intermediate-Range Nuclear Forces (INF) Treaty was signed by the United States and the Soviet Union in December 1987, Convair's Ground Launched Cruise Missile (GLCM) program recorded a "mission accomplished." In the historic agreement, which is subject to ratification by Congress, the two nations agreed to eliminate midrange nuclear missiles based in Western Europe, including GLCMs and Pershings.

The GLCM weapon system grew out of the need for NATO to modernize its Theater Nuclear Forces and substantially improve its nuclear deterrent posture. This policy decision was reached in December 1979, and Convair successfully met the December 1983 scheduled initial deployment in Western Europe.

"The dedication of the Convair work force in supporting the high-priority GLCM program and its mandated development and deployment milestones is a matter of record," said John E. McSweeney, Vice President and Convair General Manager. "It helped clear the way for the INF Treaty, which will result in significant reductions of the nuclear forces of East and West."

As a result of the treaty, all deliveries of GLCMs and transporter erector launchers (TELs) were suspended. Flight test activity was also halted. The Launch Control Center (LCC) was not affected by the treaty and will remain in the Air Force inventory to support other requirements. Four hundred forty eight out of a planned total of 597 GLCMs have been delivered. Convair has delivered 122 of 138 TELs and all of the 76 LCCs. The Sea Launched Cruise Missile program is not affected by the treaty.

GLCM had been deployed to main operating bases (MOBs) in Europe in units called "flights." A flight consists of 16 missiles, four TELs and two LCCs. The first MOB to receive the GLCM system was RAF Greenham Common in England in 1983. Four other MOBs followed through 1987 including bases in Sicily, Belgium, West Germany and another base in England.

During deployment, Convair gained high marks for its contractor support teams, which were recruited and trained in San Diego to blend with the host country while providing technical support to the Air Force at the MOBs.

Successful deployment of GLCM prompted these con-



**Last GLCM TEL Delivered.** Charles E. Painter, GLCM Program Manager; Chairman Stanley C. Pace; Col. Timothy A. Sinclair, GLCM System Program Director; and Vice President and Convair General Manager John E. McSweeney witnessed the delivery of the last GLCM production unit.

gratulatory words from then-Secretary of Defense Caspar Weinberger:

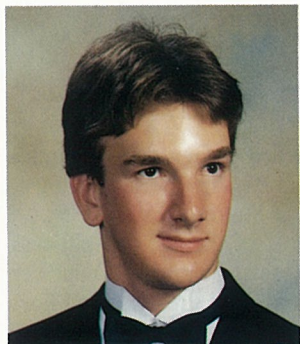
"The GLCM team of Army, Navy, Air Force, Department of Energy and contractor personnel completed the necessary actions to achieve the scheduled GLCM Initial Operating Capability in December 1983. This new capability meets our commitment to NATO and provides a significant increase in our ability to deter aggression. I have been impressed by the efforts of all those who have overcome the many problems associated in deploying a major weapon system on schedule. The men and women of the

GLCM program have my personal thanks for their dedication, hard work and contributions to this success."

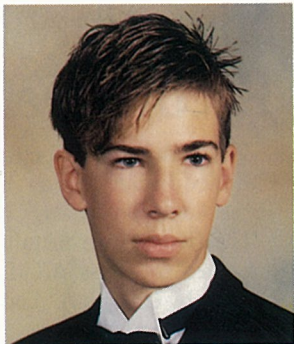
As part of the INF treaty, the U.S. Air Force Plant 19 in San Diego, operated by Convair, will be subject to spot verification inspections by the Soviets. Convair manufactured the GLCM TEL and LCC hardware at that facility. Over the past few months, Convair has been working closely with the On-Site Inspection Agency (OSIA), the government organization that will oversee inspections.

Inspections will begin as soon as the treaty is ratified by the U.S. Senate.

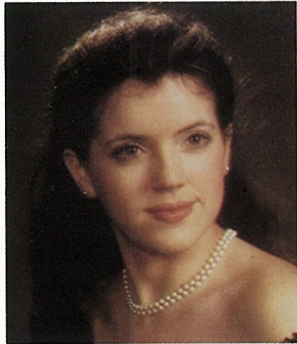




Brown



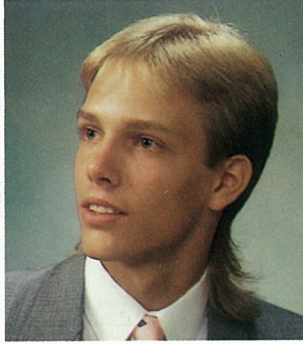
Putman



Richardson



Settergren



Stuber



Youngs

## Seven Children of Company Employees Win Four-Year Scholarships

Eight high school students, seven of whom are children of General Dynamics employees, have won company-sponsored, four-year college scholarships to begin in September.

Six of the winners have been awarded National Merit Scholarships, and two have been awarded National Achievement Scholarships. The scholarship program is administered by the National Merit Scholarship Corporation.

The National Merit Scholarship winners announced recently are:

**Gerald F. Brown** of Fort Worth, Tex., son of Gerald U. and Nina E. Brown. His father is an engineering specialist at Fort Worth. Gerald will major in physics.

**Philip T. Putman** of Fort Worth, Tex., son of Travis W. and Wanda C. Putman. His father is a senior engineering specialist at Fort Worth. Philip will major in engineering.

**Daphne M. Richardson** of Wichita, Kan., daughter of Michael M. and Emma R. Richardson. Her father is an

electrical engineer supervisor at Cessna Aircraft Company. Daphne will major in business management.

**Reuben J. Settergren** of San Diego, Calif., son of Robert B. and Deborah S. Settergren. His father is software engineer for Data Systems/San Diego. Reuben will major in computer science.

**Sean D. Stuber** of Lima, Ohio, son of David M. and Deborah J. Stuber. His father is a plant engineer for Land Systems. Sean will major in physics.

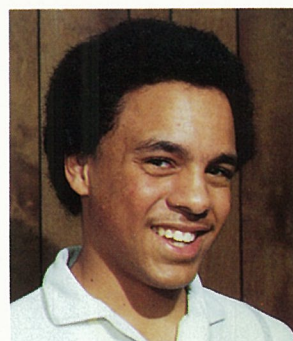
**Christine M. Youngs** of San Diego, daughter of Jack M. and Alexandra M. Youngs. Her father is a cost development engineer specialist for Space Systems Division. Christine will major in physics.

The National Achievement Scholarship winners are:

**Joshua A. Powless** of Claremont, Calif., son of Edward J. and Fredericka J. Powless. His mother is a programmer analyst for Pomona. Joshua will major in mechanical engineering.

**Leslie D. Holcomb** of Weatherford, Okla., daughter of

Virginia Holcomb. Her mother is a cook for the Porter House Restaurants. Leslie will major in business management.



Powless

Scholarships for students who live in the area of one of the corporation's facilities and who need not be children of employees.

The four-year scholarships provide a minimum of \$1,000 to \$3,000 a year, depending on the cost of tuition and the family's financial status.

Each year, General Dynamics sponsors six National Merit Scholarships for outstanding students who are children of General Dynamics employees and two National Achievement

## Company Conducting Nationwide Campaign to Get Out the Youth Vote

(Continued from Page 1)

The company's young voter program is expected to reach about three million seniors in more than 25,000 high schools nationwide.

In a letter to educators, Stanley C. Pace, Chairman and Chief Executive Officer, said, "We expect you also share our great concern that America's 18- to 20-year-olds have not taken full advantage of the right given to them by the 26th Amendment to the Constitution in 1971."

Vote America President Don V. Cogman said the company's program "is designed to enlighten students on why their one vote is so important and encourage them to partake in elections."

"We are grateful to General Dynamics Corporation for its moral and financial support," Cogman said, "without which millions of students would have again remained ignorant of the power of their vote. This campaign will be enhanced by a TV, radio and print Vote America public service campaign."

General Dynamics also is reinforcing the school program with advertising in major national publications and "Please Vote" television commercials that are running nationally.

General Dynamics was the sole sponsor for Vote America's high school vote awareness program. Other major American corporations have given material support to the new citizen and traveling public areas of Vote America's "get out the vote" program.

The overall Vote America effort got an impetus on April 15th when President Ronald Reagan acted as host for a luncheon in the White House for about 80 representatives of government and industry. Representing Pace and General Dynamics was Chuck DeMund, Corporate Director of Advertising & Promotion, who is conducting the company's "Get out the vote" program.

At the luncheon, President Reagan reiterated his support for Vote America's activities, particularly in the area

of encouraging young people to register and vote.

"This generation is a generation that's bright with hope, filled with energy and ready to make a difference," the President said. "They're talented and optimistic. But for all of that, they also have the lowest percentage of voters. So it's up to us to remind young Americans that the first step in democratic involvement is voting. With 'Vote America,' you're doing tremendous work."



President Ronald Reagan and Chuck DeMund

General Dynamics' involvement in the young voter program began last year when Vote America asked for assistance because low turnout by young voters was reaching epidemic proportions.

For example, in the 1982 elections, 75 percent of America's newly enfranchised voters failed to vote, and in the 1984 presidential election, 60 percent did not vote. Today, 50 percent of all eligible young Americans are not even registered.

In response, DeMund said, General Dynamics last December made a grant to fund the design, production and distribution of a complete vote curriculum package mailed to social studies teachers at 25,000 high schools.

This package included a teacher's guide, a student learning guide, learning materials in poster form, a map with voting statistics and state rankings, a state-by-state reference chart for voting procedures and student and teacher questionnaires. This curriculum has been endorsed by the National Association of Secondary School Principals.

"As part of its educational program," DeMund said, "Time magazine will distribute an additional 4,000 packages free to its teacher/subscribers, thus extending the get-out-the-vote effort to college campuses where some of the teacher/subscribers are employed."

Pace said the company was impressed by the results of a test program conducted last year in Jefferson Parish, Louisiana. The objective was to show the effect a classroom-oriented teaching package could have on inducing high school seniors to register and vote. The package was similar to the one underwritten by General Dynamics.

Pace said test results showed that, in the eight high schools in the test, 55 percent of the eligible seniors exposed to the materials became registered voters after completing the curriculum. In other schools in the area not included in the test, only 15 percent of the students registered to vote.

In addition to its work with Vote America, DeMund said, General Dynamics produced a television commercial and a print advertisement urging young people to vote.

The print ad "A government of half the people . . ." was run in the *Wall Street Journal* on April 15th to coincide with the White House luncheon, DeMund said. It will also run in other selected publications. (It also appeared as a full-page ad in the April issue of *General Dynamics World*.)

The company's internal communications effort toward young employees is being conducted by William B. Pedace, Corporate Director-Community Relations, and the Human Resources department.

The Vote America grant was made through the corporate contributions organization headed by Winston C. Gifford, Corporate Director-Contributions.

## Land Systems, Army Are Cohosts for Abrams Meeting for Subcontractors

Land Systems and the M1A1 Abrams Program Office will serve as cohosts for a June conference of major Abrams Tank Program subcontractors.

The meeting will update the vendors on the Abrams program and will also serve as a forum for discussion among government, Land Systems and the subcontractor representatives.

With "The Abrams Tank Systems — Growing Into The Future" as its theme, the conference will stress the need for continued teamwork in the Abrams Program.

"The Abrams is the Army's number one system because a highly competent, dedicated team of contractors and vendors fully recognized its responsibilities and obligations," said A. W. (Bill) Carion, Land Systems Vice President and Tank Systems Program Director. "This team concept becomes more important as the defense environment becomes more challenging and heavy combat systems more technically sophisticated."

In a message to be distributed to the subcontractors at the conference, Col. John Longhouser, U.S. Army Tank-

Automotive Command M1A1 Program Manager, also stressed the importance of teamwork, adding that the "Abrams team can be justifiably proud of its accomplishments over this last year — all of which have kept this country at peace."

"Your country looks to you for a quality product," he said. "Our soldiers deserve nothing less. The taxpayer demands it. And I am confident that you will meet the challenges of 1988 with a tank that exceeds all expectations."



# Fighting Falcon in Flight Evaluation Competition in Switzerland

By Joe Stout

Competition was the byword this spring at Payerne Air Base, Switzerland, where a Fort Worth-built F-16D and a McDonnell Douglas F/A-18 were matched in head-to-head evaluation missions for Switzerland's New Fighter Aircraft (NFA) program.

The F-16 and F/A-18 have competed many times since the Fighting Falcon first beat the YF-17, forerunner of the Hornet, in the U.S. Air Force's lightweight fighter flyoff in 1974. The Swiss evaluation was something new for both aircraft, however, in terms of scope and circumstances.

The NFA marks the first time the F-16 and F/A-18 have been pitted mission-for-mission, flying from the same base on the same days. During the five-week evaluation period, from early April through early May, both aircraft were housed in shelters at Payerne Air Base and serviced by respective company personnel.

A team of 27 Fort Worth employees was temporarily assigned to Switzerland to support the evaluation. The F-16D, new off the production line, was leased from the USAF and equipped for the flyoff at the SABCA plant in Gosselies, Belgium.

Pilots of the Swiss Air Force (SAF) and Swiss Defense Procurement Agency (GRD) flew the two airplanes daily. Fort Worth test pilots Joe Bill Dryden and Joe Sweeney served as instructor pilots on the evaluation flights in the two-seat Fighting Falcon.

"The flights included flying over the Alps and most of Switzerland. The F-16 performed in its usual, superior fashion and met flight schedules as planned," said R.P. "Andy" Andrews, Program Manager in Fort Worth's Flight Test Department, who assisted with the evaluation.

Other Fort Worth personnel in Switzerland for the flyoff included Ralph D. Heath, F-16 Switzerland Program Director, and Neil R. Anderson, Director of International Marketing, who served as the Swiss Flight Evaluation Director.

General Dynamics International Corporation's Bern office, headed by Oats Schwarzenberger, coordinated various activities with Swiss officials and the U.S. Embassy prior to and during the program.

Representatives of General Electric, manufacturer of the F110 engine, and Westinghouse, manufacturer of the APG-68 radar, were also on the F-16 team.

Brig. Gen. Fernand Carrel directed Swiss Air Force operations at Payerne.



**Swiss Flight Evaluation.** Brig. Gen. Fernand Carrel of the Swiss Air Force (left) is shown in F-16D cockpit at Payerne Air Base, Switzerland, with Fort Worth test pilot Joe Bill Dryden. Switzerland recently conducted extensive tests of the F-16 and F/A-18 as part of its New Fighter Aircraft selection process.

James R. Mellor, Executive Vice President-Marine, Land Systems and International, and Henry J. Sechler, Staff Vice President-International Business, visited the base for two days during the program. Dain M. Hancock, Fort Worth's Vice President-International Programs, played a major part in organizing the effort.

Swiss Minister of Defense Arnold Koller and many other Swiss government and military officials visited Payerne on a regular basis during the evaluation. Faith Ryan Whittlesey, U.S. Ambassador to Switzerland, was among other visitors.

The evaluation profiles were planned to highlight the performance, handling qualities and avionics systems of the aircraft, with particular emphasis on radar, Anderson said.

"The weather was excellent for the first half of the visit but then rain and low clouds caused numerous flight cancellations," Andrews said. "All flight requirements were met, however."

During nonflight periods, the F-16D was used for ground maintenance demonstrations, static display for official visitors and avionics demonstrations, Andrews said.

Following the evaluation program, the aircraft was returned to SABCA for contractor inspection before delivery to the 401st Tactical Fighter Wing at Torrejon Air Base, Spain.

The government of Switzerland is expected to select either the F-16C/D or F/A-18 as its New Fighter Aircraft by the end of the year.

Savings and Stock Investment Plans			
	Annual Rate of Return for the 12 Month Period Ending:		
	March 1986	March 1987	March 1988
<b>Salaried</b>			
Government Bonds	17.5%	7.4%	7.0%
Diversified Portfolio	44.3%	26.4%	(8.9)%
Fixed Income	12.2%	11.9%	11.1%
<b>Hourly</b>			
Government Bonds	16.9%	7.7%	7.2%
Diversified Portfolio	44.4%	27.9%	(9.1)%
Fixed Income	12.3%	11.9%	11.1%
<b>GD Stock Closing Price</b>	\$85.00	\$71.87	\$53.00
( ) Negative number			

## Charles Anderson Cited

Charles A. Anderson, Vice President and Fort Worth General Manager, was recently presented the 1988 Communication and Leadership Award of Toastmasters International, District 25.

District 25 includes all the Toastmasters chapters in northeast Texas. The Communication and Leadership Award is presented annually to a person who has played a major role in the local community, demonstrating outstanding communications skills. Past recipients have included civic leaders, industry leaders and media personalities.



**Caution! Aircraft Crossing.** The fuselage of a Cessna U-27A Caravan was towed recently to the Cervantes Convention Center in St. Louis, where it was rejoined with its wings and tail for display at the Army Aviation Association of America's annual convention. The U-27A is the military version of the commercial Caravan, a utility aircraft.

## Eaton to Buy Cessna's Fluid Power Division

Cessna Aircraft Company and Eaton Corporation have signed a definitive agreement for the purchase by Eaton of Cessna's Fluid Power Division in Hutchinson, Kan.

The agreement was approved by the General Dynamics Board of Directors May 4th.

"The divestiture of the Cessna Fluid Power Division is consistent with our established goal of focusing on our core aerospace and defense-related businesses," said Stanley C. Pace, Chairman and Chief Executive Officer. "We are pleased that Eaton, a proven performer in the hydraulics industry, is acquiring Cessna Fluid Power, which has similar lines of business in the same industry."

Cessna Fluid Power, in operation since 1942, builds

hydraulic components primarily for agricultural uses and employs more than 1,050.

Cessna Fluid Power built troop-carrying gliders and major components for Cessna's T-50 Bobcat twin-engine trainer during World War II and military office furniture after the war. The division began building hydraulic pumps, motors, valves and cylinders in the late 1940s. Gross sales in 1987 were approximately \$70 million.

Eaton Corporation, based in Cleveland, employs 43,000 and builds highly engineered products for the automotive, industrial, commercial and defense markets.

Terms and conditions of the General Dynamics-Eaton agreement were not disclosed.

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## Used Tomahawks Made Ready for Fleet Operations at Convair By Julie C. Andrews

With Tomahawk cruise missiles being produced and deployed in increasing numbers with the U.S. Navy, a growing part of Convair's business is in the Contractor Maintenance Area (CMA). The CMA is a depot operation that handles the missiles returning from the fleet for recertification as well as the missiles that are being readied for flight testing or refurbished after flight.

"The CMA is becoming as important as Tomahawk production," said J. W. McCreery, CMA Manager. "The availability of total Tomahawk assets, meaning new production units and the missiles processing back to the fleet from maintenance, is what is important to the Navy in keeping the weapon system operational."

One of the major CMA activities is recertification of Tomahawks that have been with the fleet for a period of time. When the missile comes back to the depot, CMA mechanics and technicians check it thoroughly for corrosion, change out the engine, recalibrate the guidance set and install any modifications that have been incorporated into the system since the missile was first delivered to the customer.

Another important part of the CMA work is preparing the missiles that have been selected for flight testing. If a Tomahawk is to be flight-tested and recovered, CMA mechanics install a Recovery Exercise Module, which contains a parachute recovery system. If the Tomahawk is to make a direct target hit at the end of the flight, the missile gets a range safety device instead of a parachute.

After a Tomahawk has been recovered from a flight test, the missile is returned to the CMA to be refurbished. Because the missile lands with a parachute, it sustains only

slight damage, mainly to the air inlet and the fixed fin. Other refurbishing of the air vehicle itself is mainly cosmetic. However, all expended components are replaced or refurbished.

In all cases, the missiles are returned to the fleet once they complete the CMA operations.

The recertification rate has been going up as the production rate increases. With the CMA function only in its third year of operation, Convair is now in the early stages of recertification work. McCreery estimated that the number of recertifications will grow through 1993 and then stabilize.

Reflecting the increase in the maintenance business for Tomahawk, the CMA has grown to a 40,000 square-foot area. The work area will have a new missile handling system, which moves the missiles from work station to work station by means of an overhead rail system. The CMA rail system is actually a "spur" off the system in the main production area located nearby.

A new storage area can accommodate the increasing number of missiles in for maintenance. Integrated test facilities with the production operation means that Convair can easily support testing activities on both production and maintenance missiles.

Convair was awarded 55 percent of the total CMA business in the Fiscal Year 1988 contract award — up from 30 percent the previous year. The division competes for the majority of the maintenance business just as it competes for the majority of the production contract award under Tomahawk dual source procurement. Convair won 70 percent of the production contract for FY 1988.



**Missile Checkout.** Mechanic Randy W. Pierce works on Tomahawk cruise missiles that have returned from the fleet to the depot at Convair for recertification.

"The CMA is a separate contract, and the same drivers go into the competition for the maintenance contract as the production contract, that is, quality, price and schedule," said McCreery. "Next year our goal is to increase our business to the maximum amount that can be awarded."

## Elementary Students Learning Public Speaking With the Help of San Diego Employees By Julie C. Andrews

Some fifth graders at San Miguel Elementary School in San Diego are well on their way to becoming confident public speakers because of the efforts of Richard Hammett, a Convair Quality Assurance advanced systems planner and enthusiastic member of Convair Toastmasters.

Hammett was looking for a youth leadership project and decided that elementary school students could learn the same lessons from Toastmasters as adult employees of a large company.

"The key to success is marketing your ideas," Hammett said. "Whether you're an engineer making a presentation to management or you're a fifth grader about to graduate to middle school, you want to be able to effectively present your point of view."

Hammett got in touch with San Miguel's speech pathologist and proposed offering an eight-week workshop to a group selected from three fifth grade classes at San Miguel. During the workshop, Hammett spent two hours a week with the students, with the help of school principal, Frank Patrick.

"We actually ran the workshop like a regular Toastmasters meeting," Hammett said, "except that we geared it for kids. We covered 'table topics,' which is impromptu speaking, and we taught the structure of a prepared speech. We also used the 'word of the week' and an 'aah' counter, who rang the bell every time a speaker used it in a speech."

At the end of the workshop, the final meeting was held with the Convair Toastmasters at its regular meeting place. The students conducted the entire meeting, which included speeches by five of the students on these topics: chocolate, pandas, rubber, parvo (a dog disease) and Martin Luther King. They were evaluated, just like a regular Toastmasters member.

"The students were great," said Marina S. Parris, Convair Toastmasters president. "They have a 15-year head

start on a lot of us adults and are overcoming the fear of public speaking at an early age. All the members really enjoyed the evening."

Hammett would like to continue the program at the school and is exploring ways of offering a more advanced level to sixth graders with the continued support of his Toastmasters chapter. "To be able to reach into a school and give young people a tool for personal growth is one of the most rewarding things I've ever done," Hammett said.

Convair Toastmasters, one of four active Toastmasters clubs at the division, has been active for 24 years. The Convair Toastmasters club has 35 members.



**Richard Hammett and San Miguel Student Tracy Bunn**

## Subsidiary Is Formed To Develop Lasers For U.S. Submarines

General Dynamics has formed a new subsidiary in San Diego called Laser Systems Laboratory (LSL) by purchasing the assets of HLX Laser and a separate corporation, Electro Optical Systems (EOS) located in Albuquerque, N.M.

Laser Systems Laboratory's prime activity involves the Submarine Laser Communication (SLC) Program for the U.S. Navy. The SLC program seeks to provide a narrow bandwidth communication link to submarines via satellite that would not compromise the operational envelope or lead to detection of the submarine, yet still provide for rapid transmission of data.

The laser communication system under development at LSL converts a xenon chloride laser to high intensity blue laser light that is capable of reaching submarines deep in the ocean. LSL is studying ways of carrying the laser communication system on antisubmarine aircraft. Additional applications include aircraft-to-aircraft communications.

Key near-term events for LSL are the flight tests this summer of the laser system under development and a major proposal for the engineering development phase of the program with contract award in early fall.

LSL provides the company with one of several identified new business thrusts into high technology military applications and undersea warfare. There are 51 employees in San Diego and 13 in Albuquerque.

## Cessna's Citation III Certified for Operation In the United Kingdom

The United Kingdom's Civil Aviation Authority has certified Cessna Aircraft Company's Citation III business jet for operation in the U.K.

The Citation III is the first new technology business jet certified in the United Kingdom. It is now certified in nine European countries: Austria, Denmark, France, West Germany, Italy, Spain, Sweden, Switzerland and the United Kingdom.

The fleet of 40 Citations based in the United Kingdom is second in size only to the fleet in Italy among European countries, followed by Germany. There are 212 Citations based in Europe.

The first Citation III delivered in the U.K. is now in service with Mountleigh Air Services Ltd., based at Leeds.

## Fort Worth's Flag Ad Is Given Recognition

The company advertisement that describes how Fort Worth workers contributed to a fund to purchase American flags for display in the F-16 factory has brought additional positive recognition to General Dynamics and its employees.

E.H. (Hank) Narmour, State Commander of the American Legion in Texas, recently presented a plaque to the Fort Worth Division on behalf of the organization's 90,000 Texas members. The memento salutes the division's factory employees "for honoring the American flag and our nation in an outstanding display of patriotism."

Narmour said the organization decided to make the gesture after several of its members saw the advertisement

in a magazine. The plaque is signed by him and American Legion State Adjutant Jim Lemley.

In accepting the plaque, Vice President and Fort Worth General Manager Charles A. Anderson said, "We were so proud of our people when they agreed that they wanted to do something to show our patriotism. I thank you for honoring our people." Anderson presented a mounted copy of the advertisement to Narmour for display in the American Legion's State Headquarters in Austin.

The Corporate Office and Fort Worth have received a number of letters, including one from Edward C. Aldridge Jr., Secretary of the Air Force, commending the flag project and advertisement.



## Valley Systems Picked for Company's Highest Safety and Health Award

Michael C. Keel, Vice President and General Manager of Valley Systems, and employees of the division have been presented with the Chairman's Award of Honor for excellence in safety and health performance in 1987.

Award of the top honor in the company's Corporate Safety and Health Performance Recognition Program was announced by Stanley C. Pace, Chairman and Chief Executive Officer.

Pace also announced that Charles A. Anderson, Vice President and General Manager of Fort Worth, and employees of the division have been selected for the Chairman's Award of Merit for excellence in safety and health performance in 1987.

In addition, Certificates of Achievements for their performances in 1987 were awarded to:

— Robert W. Truxell, Vice President and General Manager of Land Systems, and employees of the division.

— Lucian A. Lincoln, Chairman and Chief Executive Officer of Freeman United Coal Mining Company, and employees of the company.

— Asaph H. Hall, Vice President and General Manager of Data Systems Division, and employees of the division.

— John E. McSweeney, Vice President and General Manager of Convair, and employees of the division.

— Melville R. Barlow, Vice President and General Manager of Electronics, and employees of the division.

The presentations were made by Pace recently in St. Louis.

The Corporate Safety and Health Performance Recognition Program is designed to recognize those divisions and subsidiaries that excel in safety and health efforts.

Criteria used to measure a division's performance include a broad range of measurement elements, such as performance on the Safety and Health Audit and Program Evaluation (SHAPE) reviews, trends in workers' compensation costs, performance in the Management Effectiveness Program (MEP) and the overall quality of personnel and programs.

In a letter to Keel announcing the award, Pace said, "Although Valley Systems is a relatively young division, excellent strides have been made in the development and implementation of your Safety and Health Program. . . . This year, the Valley Systems Division rated the highest of all the General Dynamics' divisions and subsidiaries."

In a letter to Anderson, Pace said, "Fort Worth's Safety and Health Program has been an example of quality performance since the 1940s. . . . This year, the Fort Worth Division continued its excellent performance heritage."

Pace asked heads of the winning divisions and subsidiary to extend his congratulations to members of management and employees who were responsible for the outstanding performance.

"I hope this splendid achievement will promote continued interest in your Safety and Health Programs and encourage your employees to continue their safe work habits in 1988," Pace said.



**Performance Recognized.** Stanley C. Pace, Chairman and Chief Executive Officer (left), presents the Chairman's Award of Honor to Michael C. Keel, Vice President and General Manager of Valley Systems, for the division's excellence in safety and health performance in 1987.

## Five NASP Contractors Agree to Cooperate on Materials Technology

General Dynamics and the other four contractors working on the National Aero-Space Plane (NASP) program have agreed to cooperate on materials technology development to ensure that advanced materials are available in time to meet the NASP program schedule.

Fort Worth will lead efforts in developing refractory composites. McDonnell Douglas will develop titanium metal matrix composites, and the third airframe contractor, North American Aircraft Division of Rockwell International, will work on titanium aluminide metal alloys.

The two propulsion contractors, Pratt & Whitney and the Rocketdyne Division of Rockwell International, will develop high-specific-creep strength materials and high-conductivity composites, respectively.

The total value of the NASP materials development program will be \$140 million over 30 months.

Officials at the NASP Joint Program Office at Wright-Patterson AFB, Ohio, said the cooperative agreement is unprecedented in the development of advanced aircraft and engines. Competing contractors usually develop designs independently, with the government selecting the best overall proposal, they said.

The cooperative approach is being used on the NASP effort to save time and reduce costs for the contractors. Development results will be shared among the five companies, said Armand J. Chaput, Fort Worth's Acting NASP Program Manager.

Dr. Robert R. Barthelemy, Manager of the NASP Program at the USAF's Air Systems Division, noted that the materials effort is critical to the program's success. "These materials will provide the assurance necessary to meet our program goals," he said. "By involving contrac-

tors, materials suppliers and government laboratories in a combined, focused effort, we will make maximum use of the resources available and get the material we need," he said.

NASP is a joint program of the Department of Defense and NASA.

The company received a \$25.5 million contract for preliminary design of a NASP prototype vehicle last October. The NASP is planned as a single-stage vehicle that will be capable of taking off from a conventional runway and accelerating directly into orbit, or of flying in the atmosphere at speeds greater than Mach 5.

Final contractor selection and the beginning of NASP prototype construction are scheduled for mid-1991, pending a decision to initiate the next phase of the program. Flight tests could begin in 1994 or 1995.

## Chairman Pace Gives His Views on Cooperative Education in Interview

General Dynamics Chairman Stanley C. Pace expressed the company's strong support of cooperative education recently when he was interviewed by two engineering co-ops at Fort Worth.

L. Chad Watts, who attends Mississippi State University, and L. Scott Stewart, who attends the University of Arkansas, are co-op employees in the division's Manufacturing Development organization. They interviewed Pace for an article to be published in a co-op newsletter at the division.

General Dynamics has more than 1,000 cooperative education employees, representing universities nationwide, who work at most major divisions of the company. They perform job assignments and attend regular classes during alternating school semesters.

Watts and Stewart interviewed Pace in his St. Louis office by telephone from Fort Worth's Videoconferencing Center. The discussion centered on the co-op program and career development. A few of the questions and Pace's answers follow:

**Question:** Is cooperative education a valuable program for General Dynamics?

**Pace:** "I'm a great supporter of the corporation's plan for co-ops. It's a concept that I've supported for many years, both at General Dynamics and at TRW. (Pace worked at TRW from 1954-85 and was Vice Chairman during his last six months there.) The basic advantage of the co-op program is that it allows the student to see what the workplace is like. The program motivates students to learn more from their academic studies."

**Question:** How important are graduate-level studies?

**Pace:** "I firmly believe in education, and especially advanced education. You have to be prepared so that if the door opens, you can go in. Education is something that you cannot lose."

**Question:** What are the most promotable qualities in an employee?

**Pace:** "The most important quality is the desire to accept responsibility for getting a job done, assuming the person is qualified through education, training and experience. I



**Long Distance Interview.** Fort Worth Cooperative Education employees Chad Watts (left) and Scott Stewart talk with Chairman Stanley C. Pace via telephone from Fort Worth's Videoconferencing Center. Pace shared his views on the co-op program, advanced studies and other subjects.

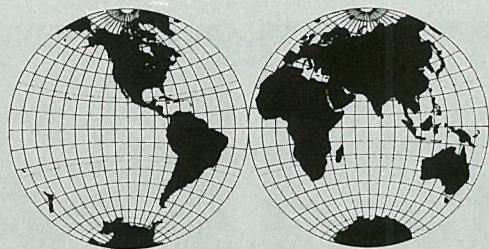
tend to favor the person who has a great desire to pick up the responsibility for a task and see it through until completion. Even when a task fails, if the person in charge takes full responsibility, I see that as a positive trait. I like the person who has the attitude to not make excuses, but to go on and get the job done."

**Question:** What is needed most to ensure continued

success for General Dynamics?

**Pace:** "Three things are needed — technological superiority, contract performance and cost reduction. I think that performance on our present programs, in all three areas, will be a deciding factor as to whether we will receive future contracts."





## Around the World

**CHQ:** Miles A. Libby III joined as DIO Program Manager-Defense Initiative... Robert D. Box as Financial Analyst... Susan G. Margala transferred from Pomona and was promoted to DIO Office Administrator... Marvin H. Hammond transferred from Land Systems and was promoted to DIO Director of Technology.

**Fort Worth:** William B. Anderson Jr. was appointed to Engineering Director... Robert C. Bolz Jr. to F-16 Programs Director... Johnnie W. Atkison and Rodger Gilley were promoted to Production Management Specialist... Roger G. Bedell to Senior Project Engineer... Melanie L. Belz to Inspection Supervisor... Carmon D. Carter, Ewel H. Draper, Larry J. Rodgers and Michael G. Slimmer to Tooling Supervisor... Billy L. Ferris and Wendell M. Pichon to Logistics Specialist... Loran T. Francis to Engineering Administrative Group Supervisor... Stephen K. Hadley and Kenneth W. Seaver Jr. to Project Engineer... Gerald D. Hardgrave and David H. Jagers to Project Manager... Guy P. Hogan to Contracts Manager... Robert A. Harra to EMC Production Chief... Richard E. Lacoe to Logistics Group Engineer... Paul M. Mahar to Quality Assurance Chief... Anthony Nigro to Senior Marketing Representative... William G. Nutt to EEO Programs Manager... Daniel W. Reagan to Principal Field Service Engineer... Dale V. Vinson to Logistics Group Supervisor.

**Electric Boat:** Peter G. Standley was promoted to Engineering Chief... Robert I. Farrior and James Noonan to Quality Chief... Bob A. Peters and Walter F. Rapoza to Ship Superintendent... Denzel L. Andrews, John S. Bentley, Gregory M. Griffin, Danny Holman and Robert W. Shepard to Engineering Supervisor... Nancy E. Beckwith and Emil J. Troiano to Quality Assurance Supervisor... Raymond J. Franco to Change Control Supervisor... Scott C. Barnwell and Charles W. Hays to Nuclear Test Supervisor... George Kenyon and Earl C. Whitford to Material Progressing & Control Supervisor... Robert J. Minnie to General Foreman... Daniel S. Freund, Keith R. Gillette, John D. Isherwood, David Johnson, David P. Kozek, John S. Marr, Richard W. McCoy, Craig T. Mellor, Christopher C. Myers, Michael D. Pettini, Wilbur E. Seidel, David A. Smith and Jeffrey J. Toth to Foreman... Raymond Wong to Purchasing Agent... Michael J. Panciera, William Rodgers and Stephen B. Treadow to Admin/Control Coordinator... At Newport, Richard H. Messier to Chief Engineer... At Kings Bay, Robert W. Sanders to Logistics Supervisor... At Idaho, Joseph A. Sasso to Engineering Manager... Napoleon J. Gauthier, Douglas B. Poole and Alton F. Rogers to Assistant Superintendent... At Kesselring, Edward J. Peterson to Inspection Foreman... Susan M. Albrezzi to Security Compliance Coordinator... James F. Gabrysiak to Refueling Procedures Supervisor... At Charleston, James R. Marks to Manufacturing Engineering & Facilities Chief... John B. Clarey to Superintendent... Marvin Mayberry to Foreman... John L. Drugan to Group Trade Planner... At Quonset Point, Thomas Valenti to Manufacturing Manager... Thomas Algieri and William Smyth to Area Superintendent... Alan J. Moreau to General Foreman II... John P. Kopka, James F. Murphy and Kimberly J. Stockslager to Foreman II... Frederick W. Russell to Foreman III... Richard F. Michalek and Jose M. Oliveira to Senior Packaging Administrator.

**Convair:** John J. Collins was promoted to Indirect/Allocated Budget Manager... James S. Keate to Financial Planning Manager... Michael L. Bonine and Karyn K. Thatcher to Quality Assurance Supervisor... Frank W. Chabza to Engineering Chief... James R. Currie to Administrative Chief... Robert J. Kamensky to Engineering Specialist... Walter E. Mooney Jr. to Engineering Staff Specialist... William D. Lindsay to Manufacturing Engineering Specialist... William B. Stonecipher Jr. to Material Operations Supervisor.

**Space Systems:** Kenneth C. Nuss was promoted to Program Manager... Michael M. Busley to Facilities Chief... P. Jane Duby to Contracts Administrator... Brian O. Niznik to Senior Marketing Representative... Jasna M. Poljak to Financial Supervisor... Carl Orav to Engineering Chief.

**Electronics Division:** Joan M. Hoover was promoted to Program Manager... Robert Fredenburg to Test Program Set Lead Engineer... Dawn A. Martinski to Office Administrator... Everett E. Turner to Project Manager... Sandra A. Boyden to Engineer... Garvin T. Nowell to Quality Control Senior Specialist... Sue M. Race to Systems Analyst.

**Land Systems:** Ramish C. Sapra was promoted to Estimating Manager... Joseph J. Borys to Manufacturing Programs Manager-Scranton... Scott B. Griffith to Foreman... Henry Macklin to Assembly Manager... Victor J. Aquino to Engineering Services Chief... William D. Williams to Industrial Engineering Supervisor... Christine Gerichten to Production Planning Supervisor... Teresa Dunn to Quality Assurance Engineering Supervisor... Joseph P. Burke to Maintenance General Foreman... Richard R. Torres Jr. to Human Resources Supervisor... Jeffrey C. Zatkoff to Senior Industrial Engineering Analyst... Hem R. Vij to Engineering Chief... Peter L. Gardulski to Principal Engineer... Ernest M. Dykes to Senior ILS Field Engineer... William P. Pietrangelo to ILS Field Operations Supervisor.

**Pomona:** Andi C. Chou was promoted to Staff Assistant... Richard W. Crawford Jr. and Michael G. Wagner to Group Engineer... Brian T. Patterson to Cost Control Specialist... Daniel E. Williams to Manufacturing Engineer... Nancy S. Fredrick to Staffing Chief... Carol A. Schultz to Security Representative.

**Valley Systems:** James A. Giglio was promoted to Group Engineer... Robert G. Merritt to Proposal Development Manager... Joseph D. Weber to Quality Assurance Chief.

**Cessna:** Ted Farid was promoted to Citation International Sales Manager... Dennis Dungan to Engineering Supervisor... Kevin L. Smith to Material Requirements and Planning Manager... Terry Whitesell to Cost Estimating Supervisor.

## USAF F-16 Teams and Pilots Take Top Honors

U.S. Air Force teams flying Fort Worth-built F-16s won the top four places and all six individual honors in the Tactical Air Command's recent Long Rifle IV competition at George AFB, Calif.

Long Rifle is a semiannual bombing competition between the 12th and 9th Air Forces, which include all tactical fighter wings of the Tactical Air Command.

To promote the realism of the event, four-member teams are selected at random and on short notice to represent their units. Each four-aircraft team is required to fly from its home base, refuel twice and attack a tactical target at a specific time. The designated base-to-target routes require four to five hours of flight time.

First place in the competition went to an F-16 team from Nellis AFB, Nev. Second place was won by the F-16 team from Luke AFB, Ariz., and third and fourth were taken by F-16 teams from Hill AFB, Utah, and Shaw AFB, S.C., respectively.

Fifteen teams competed in the event. Other aircraft flown included F-4s, A-10s and F-111s. The competition was held April 8th.

F-16 teams and pilots had the highest scores in each event of the competition: time on target, tactical bombing, dive bombing, low-angle bombing, low-angle low-drag bombing and strafing. Lt. Butkus Lofgren of the 474th Tactical Fighter Wing, Nellis AFB, was named the competition's Top Gun. F-16 pilots had 15 of the top 20 individual scores overall.

Brig. Gen. Mac Armstrong, 831st Air Division Commander, George AFB, termed Long Rifle IV a success. "Our air crews flew well, and they accurately attacked targets after being in the air for a long time, just like we would do in a war," he said.

"Competitions like these provide an excellent test for our flight commanders and the air crews they lead," he said.

## Deliveries to Begin For Standard Vehicle Mounted Launchers

Low-rate production of Air-to-Air Stinger (ATAS) and Standard Vehicle Mounted Launcher (SVML) has begun at Valley Systems Division. Deliveries of SVML start in June. ATAS deliveries are scheduled to begin in January 1989.

Valley Systems has a contract from the U.S. Army Missile Command (MICOM) for 56 ATAS systems, each containing one launcher and one interface electronics unit. The U.S. Army Aviation Systems Command will place ATAS on OH-58C and D helicopters for self-defense.

The SVML contract is also from MICOM and is for 20 systems. Each SVML contains two launchers and one interface electronics unit and will be supplied to the Army as part of the pedestal-mounted Stinger program.

ATAS and SVML have a production potential through the mid-1990s, according to Robert D. Connell, Program Director-ATAS. He said that the government has indicated a need for 2,800 ATAS launchers and 2,000 interface electronics units through fiscal year 1994. The government has also cited a need for 2,500 SVML and 1,200 interface electronics units through fiscal year 1995.

Acceptance test equipment is being built by Pomona's Camden Operations, as are the circuit cards for ATAS and SVML.



**Recognized for EEO Support.** Electronics Division has instituted a special award program — the first of its kind in General Dynamics — to recognize annually a department that demonstrates superior support for Electronics' affirmative action program. Percy L. Myers, Manager of Community Relations/EEO-AA (right), presents the award to the Information Resource Management department represented by Cindy Henson, Manager-Systems Management and Administration, and James J. Coney, Director-Information Resource Management.

## Two VICA Students Win Bronze Medals At Skills Olympics

Two students from the Vocational Industrial Club of America (VICA), who were sponsored by Pomona, recently won bronze medals at the International Skills Olympics in Sydney, Australia.

Kevin Matthies brought home a bronze medal in the milling contest and Aaron McGinty took third place in computerized numerical control machining. The competitors are the first to win medals for the United States in these events. The entire U.S. team won five medals — one silver and four bronze.

"All of the team members were outstanding and deserve a lot of credit," said William Clarke, Training Representative. "The Internationals showed that we have world-class performers at Pomona."

In addition to Matthies and McGinty, two other delegates, William Andrews and Gary Sawyer, were trained at Pomona in lathe turning and press toolmaking. The division has been sponsoring VICA students since 1979. According to John Whiteside, Division Vice President - Human Resources, the program provides benefits to the students and the division.

"We have hired 44 VICA members who were recent high school graduates and placed them in various trade work," Whiteside said. "As a result, 89 percent of these people are still with us, and as a group, they are in the top 10 percent in productivity and their scrap and rework rates are well below average."



## Advanced Machining System Is a Cost-Saving Group of Technologies

At first glance, Fort Worth's Advanced Machining System (AMS) appears to combine the complexity of a Rube Goldberg contraption with the high tech efficiency of Star Wars-era devices.

On closer inspection, the AMS reveals itself as a collection of technologies that have been integrated to make something that has never been made before — a system capable of automating all major manufacturing functions.

"The general thrust of the AMS program was to design and build an integrated manufacturing center that is large enough to demonstrate meaningful cost savings," said Robert L. McMahon, Manager of Manufacturing Systems and the AMS program at Fort Worth. "The real development challenge was in applying the technologies." Fort Worth began the AMS program in 1984 with a \$13 million U.S. Air Force contract.

Fort Worth and Data Systems employees developed the AMS under the technical direction of the Air Force's Wright Aeronautical Laboratories. The system incorporates innovations capable of automating the entire range of manufacturing processes, including engineering, fabrication, quality assurance and management functions.

The AMS consists of two parts: an Integrated Manufacturing System (IMS) and a Flexible Machining System (FMS). "The IMS provides the computerized network that links engineering, order generation and control, process planning, shop floor and quality assurance functions," McMahon said.

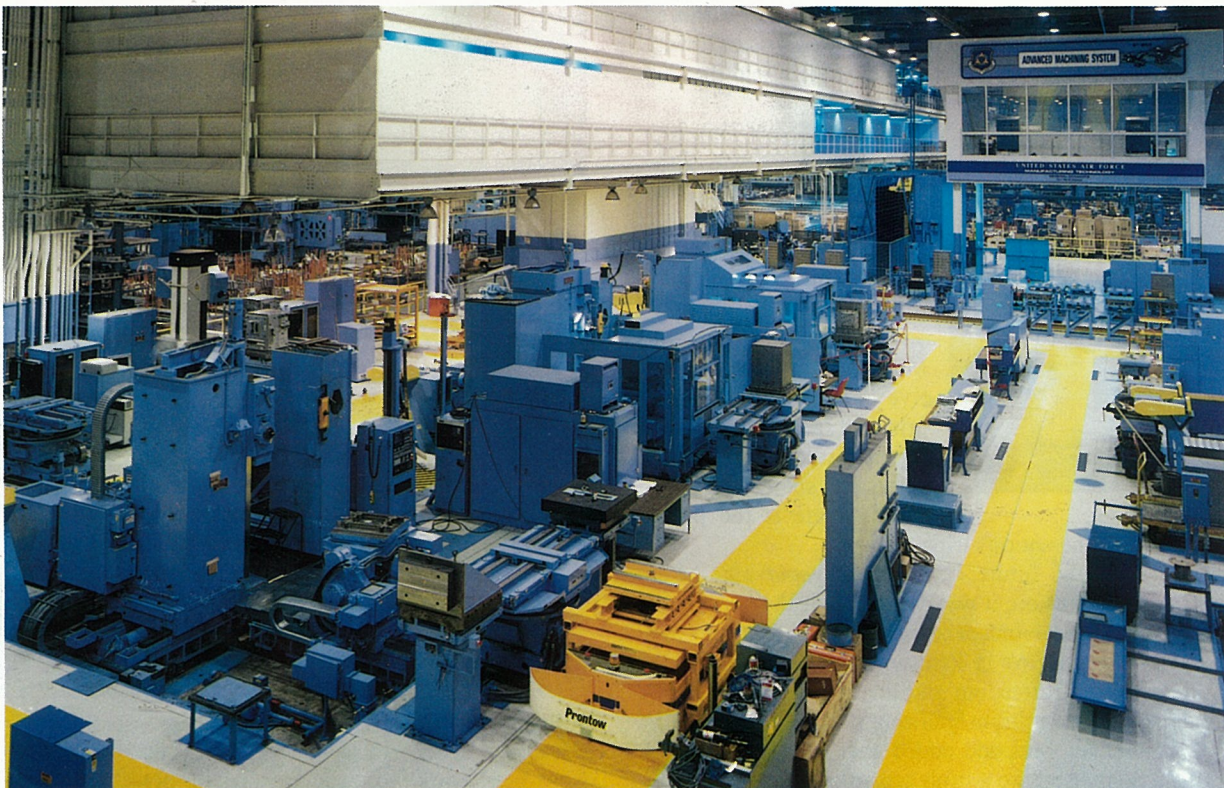
"The components of the IMS work in concert to automatically create data needed to manufacture a product, coordinate data flow and maintain product integrity in an unmanned, paperless manufacturing environment," he explained.

The FMS, installed on the factory floor, is the most visible part of the AMS. The FMS is designed to schedule part production and produce 80 different types of complex-geometry, machined aluminum aircraft parts.

The basic sequence of part manufacturing within the FMS is as follows:

Under computer control and scheduling, a track-guided automatic storage/retrieval system (AS/RS) selects an aluminum part blank — the raw material from which parts are machined — from one of 400 storage slots in a material storage area. The AS/RS delivers the material to a load/unload work cell, where it will be automatically attached to a tooling fixture.

In the load/unload work cell, a three-camera vision system automatically inspects the material to ensure that the correct part blank has been selected. The material is



**AMS Overview.** A bird's-eye view of Fort Worth's Advanced Machining System shows an automatic guided vehicle following a yellow path as it moves among work cells in the system. In the background, at right, is the AMS control center tower.

then loaded on a tooling fixture by a robot that can alternately unscrew fixture attachment bolts, pick the material up and replace the bolts.

From the load/unload work cell, the fixture pallet — which has four sides for multiple parts presentation — is taken by an automated guided vehicle (AGV) to a holding area with storage stations for 18 pallets.

When the machining process is scheduled to occur, another automated guided vehicle picks up the pallet from the storage area and carries it to one of six machining centers, where it is automatically loaded on a five-axis numerical control milling machine.

The numerical control machining process can take from one to several hours. Afterward, the tooling fixture is automatically transferred to a coordinate measuring machine where all part parameters are checked for accuracy with touch and optical probes.

The fixture pallet is then returned to the load/unload

work cell and the part is removed from the fixture by the robot.

The final work cell in the FMS is a tab cut-off station where aluminum tabs used to hold parts on the tooling fixtures are removed.

In normal operation, manual intervention occurs only when raw material is placed in a storage bin or when finished parts are picked up there.

An operator control tower overlooks the AMS area in the Fort Worth factory. Inside, operators use computer screens to monitor machine operation and work progress in the system. The terminals are also used for fault isolation in case of possible malfunctions.

Since the beginning of preliminary operations in 1986, the FMS has produced more than 3,000 production F-16 parts, comprising 20 different part types. "The quality of the parts has been outstanding," said McMahon.

## Fort Worth Employees Wear Police Badges for This Moonlighting By Joe Stout

Several employees at Fort Worth lead double lives, leaving the office and factory environments where they work by day to wear the blue uniforms and shining badges of police officers on city streets by night.

When people choose to moonlight, it is usually for the money — but not in this case. These people are not paid for their after-hours occupations.

The employees are reserve police officers with the Fort Worth Police Department. They have been through extensive law enforcement training. They spend at least eight hours each week doing the same things that full-time police officers do.

The reservists patrol the streets in squad cars, stop suspicious or ordinance-violating vehicles and issue traffic citations. They respond to various types of emergency calls — from domestic disturbances to reports of felonies being committed — and they make arrests, when necessary.

Most of the police reservists perform far more than the minimum weekly requirement of service, according to their leader.

"These guys are dedicated," said Sgt. William J. Baker, the Fort Worth Police Department's Reserve Commander. "If the city had to pay for all the extra work the reserve force does, the city would go broke."

Les R. Diefenbach, a technical publications editor in the Logistics Department, is one of a number of police reservists who work at the division. "Since we're not getting paid, we're obviously doing it for some motivation besides money," Diefenbach said. "I like to think that we're helping people, and I believe that's the main reason we all do it."

"Participating in the reserves gives me a good sense of community service," said Donald Middlebrooks, a crane operator in the F-16 factory. "It's mainly a sense of allegiance to the community. I consider myself a 'people' person, and I like having a chance to meet and help people."

Another police reservist, software engineer Jerry W. Crowell of Data Systems Central Center, described police work as "a good break from the office environment." Crowell said his work as a police officer has supplemented

his professional development with the company by enhancing his communications skills.

"A lot of your effort as a patrol officer is put into understanding a situation and talking with people," explained Ronald D. Glass, a Propulsion Analysis engineer who is a reservist.

Besides their patrol duties, the reservists sometimes fill in for regular officers by providing security at special events such as Mayfest, a communitywide entertainment and arts festival that is held in a local park each spring.

"When we perform that type of service, it frees up the regular officers so that they can continue to patrol the city and be available for calls as needed," Diefenbach said. "It helps to ensure that the city is protected by a police force that is operating with a full quota of personnel."

Technical publications editor B.J. "Bob" Hopkins has been with the police reserves for more than three years and is certified as a Texas Advanced Peace Officer, giving him

the same credentials that full-time officers carry. Hopkins also serves as a volunteer firefighter in the suburban community where he lives.

Reserve police officers are trained for certification at three levels. Their certification determines whether they are authorized to work alone on patrol, alone as a backup unit to full-time officers or as part of a two-officer team.

Training covers criminal procedures, state law and firearms handling, among other subjects. Each course takes about three months to complete.

A total of 87 reservists in Fort Worth worked 1,780 eight-hour patrol shifts and 7,352 hours of special events duty in 1987, Baker said. The reservists issued 1,845 citations and made 783 arrests and responded to 8,213 police calls. They recovered 66 stolen vehicles.

"There's a great sense of pride in the Fort Worth Police Department. I'm proud to be part of it," Middlebrooks said.



**Employees on Reserve Patrol.** Les Diefenbach (left) and Don Middlebrooks are among several Fort Worth Division employees who assist the Fort Worth Police Department as reserve officers. The volunteers spend at least one evening each week performing regular police duties.



## Pennsylvania, 10th Trident Submarine, Is Christened at Electric Boat

The Commonwealth of Pennsylvania was honored April 23rd when a Trident submarine was christened with its name, and a congressman from the state said the ship has a "triple crown" tradition to uphold.

The Trident submarine *Pennsylvania* (SSBN 735), 10th ship in her class, was christened while afloat in the land level construction facility graving dock at Electric Boat's Groton, Conn., shipyard.

The Hon. Joseph M. McDade, U.S. Representative from Pennsylvania, principal speaker at the ceremonies, told almost 3,100 guests and spectators:

"My state is the proud repository of the nation's triple crown.

"Wherever the future USS *Pennsylvania* may be in pursuit of its mission, it will carry with it the heritage of the Declaration of Independence, the Constitution and the Bill of Rights. We in Pennsylvania, whose history is synonymous with freedom and liberty, are proud to bestow this honor on this magnificent ship."

Congressman McDade added that the employees of Electric Boat also have a triple crown of their own.

"Your triple crown comes from excellence in three of the most significant areas in our military establishment: tradition, teamwork and security," he said.

Congressman McDade said Trident submarines "pose an insoluble targeting dilemma to the leaders of the Soviet Union. That dilemma prevents the USSR from considering an option of attacking us with nuclear weapons. That force also provides a major disincentive for the Soviets to attack us conventionally."

"The net result is that we can take a much more peaceful approach to our defensive posture," he said. "Although the Trident is a threatening weapon, it is not a weapon of aggression."

Stanley C. Pace, Chairman and Chief Executive Officer, said that the country has entered the age of extreme federal frugality "but at a time when the government is looking for bargains, there is no better bargain than the ship we launch today."

Pace said that the 560-foot-long *Pennsylvania* will be the second submarine to carry the advanced Trident II missile.



**A Big Splash.** Mrs. Marilyn Kay Garrett, sponsor for the Trident submarine *Pennsylvania*, smashes a bottle of champagne against the sail as she christens the ship. Trying to keep from being doused is Stanley C. Pace, Chairman and Chief Executive Officer, and watching the proceedings at right are Vice Adm. Bruce DeMars, Assistant Chief of Naval Operations for Undersea Warfare, and Juliana K. Garrett, Maid of Honor.

"This missile has been so successful in its design and development that Congress — which has never been a shy critic of defense — recently cited it as our country's best-managed strategic weapons program," he said.

The high point of the ceremony came when Mrs. Marilyn Kay Garrett, wife of Under Secretary of the Navy H. Lawrence Garrett III, christened the ship.

"In the name of the United States, I christen thee *Pennsylvania*. May God bless her and all who sail in her," she said. She then smashed a bottle of champagne against a striker bar welded to the *Pennsylvania's* sail.

That was followed by a long blast from the *Pennsylvania's* ship's whistle and the playing of the traditional "Anchors Aweigh" by the United States Coast Guard Band.

Also participating in the ceremony were Vice Adm. Bruce DeMars, Assistant Chief of Naval Operations for Undersea Warfare; Brig. Gen. Robert H. Appleby, Assistant Division Commander, Infantry Support-Pennsyl-

vania; the Hon. Samuel Gejdenson, U.S. Representative from Connecticut; and Fritz G. Tovar, Vice President and Electric Boat General Manager. Mrs. Garrett's Maid of Honor was her daughter, Juliana K. Garrett.

*Pennsylvania* is the first submarine and the fourth U.S. Navy ship to bear the name. The first *Pennsylvania*, the largest sailing warship built for the Navy, was burned to the waterline in 1861 to prevent it from falling into Confederate hands during the Civil War. The second *Pennsylvania*, Armored Cruiser 4, opened an era in naval aviation when a plane landed and took off from a platform on its afterdeck in the winter of 1910-1911. The most enduring ship to bear the name was the battleship *Pennsylvania* (BB 38). Commissioned in 1916, *Pennsylvania* formed with forces of battleships for assaults and occupations of various islands in the Pacific. It received eight battle stars for its service during World War II before being decommissioned in 1946.

## Public Gets 'Big Bang' Out of Material Service Quarry Open House

Material Service Corporation's Federal Quarry in McCook, Ill., expected no more than 750 people to attend its open house on April 9th.

More than 2,000 people showed up.

Originally scheduled from 9:30 a.m. - noon, the open house attracted its first arrivals at 8:50 a.m. People were still coming at 1:30 p.m.

"It's natural for something as large and busy as the quarry, with trucks coming and going all day, to attract attention," said Morris Lauwereins, Senior Vice President of Operations. "However, we're still overwhelmed at the response we received to our invitation."

Perhaps the fact that Federal Quarry had never before held an open house, despite having been in business for 50 years, had something to do with the large turnout. Federal Quarry has mined more than 54 million tons of aggregate since it was formed in 1938.

Federal Quarry made sure that those who attended its open house had a real blast. Besides a host of other activities, Federal Quarry invited the children on hand to join Lauwereins in the countdown for detonation of charges that dislodged 14,000 tons of rock from the quarry wall. The parents in attendance joined in as well.

"We received many positive comments and letters from community residents," said Louis Levy, Vice President of Public Affairs and Assistant to the Chairman. "I'm very happy with the results and the effort we all put forth to make this event worthwhile."

Although many helped to make the open house successful, Alan Smith, Assistant Vice President of Operations, Will Price, Area Manager, and Dave Olson, Plant Superintendent, were key members in the planning and execution.

To learn about the quarry's operation, visitors viewed a video presentation of Federal Quarry blasting preparations and received a comic "quarry information" brochure featuring Professor Boulder and Dr. Living-Stone. Children also were given crayons and encouraged to participate in a coloring contest of a drawing of a red-mix concrete truck that was on the last page of the brochure. The contest is being judged by local art teachers, who will select three winners to receive U.S. savings bonds.

In addition to participating in a raffle drawing, guests received souvenirs of frisbees and thermal mugs. And, everyone enjoyed refreshments, visits with volunteers from Brookfield Zoo costumed as animals, a fossil exhibit that was explained by Lyndon Dean, Material Service geologist, and the extremely popular bus trips down 340 feet onto the quarry floor.



Guests at Material Service's Federal Quarry Open House Enjoyed Refreshments, Meeting With "Animals" and Learning About Rocks



## Electronics Division And Tadiran Picked For SINCGARS

General Dynamics Electronics Division has been selected by the U.S. Army as the second-source producer for the Army's Single Channel Ground and Airborne Radio System (SINCGARS) program. The division, which is teamed with the Israeli company Tadiran, was notified of its selection on May 31st. The initial contract, worth approximately \$22 million, is for 550 receiver-transmitters and ancillary equipment.

The Army has a total requirement for more than 265,000 SINCGARS tactical radio communication systems. Future procurement will be competed between General Dynamics and ITT Aerospace/Optical Division, the current producer of the radio. Potential program value could exceed \$2 billion.

The General Dynamics/Tadiran team was selected over four other competitors. According to the Army, "General Dynamics was chosen as the best overall source since its proposal was equal to or better than the other proposals in every area evaluated and offered the lowest overall price."

"Being selected by the U.S. Army to produce SINCGARS represents a significant program win for our division," said Melville R. Barlow, Vice President and Electronics General Manager. "The efforts of our division and our partner, Tadiran, underscore the common commitment of each to this very important program. We look forward to working closely with the Army on the SINCGARS program."

Tadiran's CNR 900 tactical radio will be used as the technical baseline for system design. Tadiran is one of the

(Continued on Page 2)

### Readership Survey

A questionnaire asking employees their views on *General Dynamics World* appears on Page 10.

## Navajo Tribe to Build Valley Systems Plant At Farmington, N.M.

The Navajo Tribe will build an electronics assembly plant for Valley Systems Division near Farmington, N.M.

The 30,000-square-foot facility will be located on tribal lands in the Navajo Agricultural Products Industry (NAPI) Industrial Park and will be leased by General Dynamics for 15 years.

Construction is expected to begin later this year and be completed in mid-1989.

After construction, Valley Systems is expected to hire between 150 and 200 workers to engage in assembly tasks. The success of a well-established partnership between the Navajo Tribe and General Dynamics, as well as the availability of skilled personnel, attracted Valley Systems to the area.

Valley Systems, headquartered in Rancho Cucamonga, Calif., is a leading developer and producer of weapon systems for the U.S. armed forces. The division currently manufactures Stinger and the Rolling Airframe Missile.

A Pomona facility has been located on the Navajo Reservation at Fort Defiance, Ariz., since 1967.

## Pace Assumes Post As National Chairman Of United Nations Day

Chairman and Chief Executive Officer Stanley C. Pace officially assumed duties as 1988 National Chairman of United Nations Day at the 30th Inaugural U.N. Ball in New York June 3rd.

Pace, who was appointed national chairman by President Ronald Reagan, told the audience at the ball that "throughout its nearly 43-year history, the United Nations has demonstrated in myriad ways — some large, but many small; some heralded, but many unsung — that it is more than useful. That it is essential."

As National Chairman, Pace will coordinate activities throughout the United States marking U.N. Day Oct. 24th. Pace served as Missouri U.N. Day Chairman in 1987.

GENERAL DYNAMICS

# World

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**Thailand's First Fighting Falcon.** Air Marshal Pisit Srikalasin inspects the first F-16A delivered to the Royal Thai Air Force with Kevin R. Dwyer, Fort Worth's Chief Test Pilot. Dwyer capped the delivery ceremony with a flight demonstration in the aircraft.

## Royal Thai Air Force Receives Its First F-16 In May 26th Ceremony at Fort Worth Plant

The Royal Thai Air Force (RTAF) became the 14th air force in the world to operate the F-16 when it received its first Fighting Falcon in a May 26th ceremony at Fort Worth.

Air Marshal Pisit Srikalasin, RTAF Deputy Chief of Staff, officially accepted the single-seat F-16A on behalf of his country.

Thailand ordered 12 F-16A/Bs in 1985 and placed a follow-on order for six additional aircraft in late 1987. The RTAF will receive the 14 F-16As and four two-seat F-16Bs before 1991. The initial aircraft were flown to Thailand this month.

"The Royal Thai Air Force, at this moment, joins the ranks of the forefront air forces of the world in having the F-16 in commission," Air Marshal Pisit said. "We believe that this aircraft best meets our defense needs to maintain the peace and stability of Thailand and thereby those of the Southeast Asian region."

Brig. Gen. Ronald C. Spivey, Commander of the International Logistics Center at Wright-Patterson AFB, Ohio, and John P. Brailey, Director of Engineering at the F-16 System Program Office at Wright-Patterson AFB, represented the U.S. Air Force at the ceremony.

"The F-16 is unparalleled in the tactical aviation arena," General Spivey said. "Its navigational and weapons delivery systems provide pinpoint targeting accuracy. The engine and airframe design, which give it superb acceleration and the ability to sustain high-g maneuvering, completely dominate any airborne arena."

General Dynamics was represented by James R. Mellor, Executive Vice President-Marine, Land Systems and International, and Charles A. Anderson, Vice President and Fort Worth General Manager.

"This is an exciting and gratifying moment for the people of General Dynamics," Mellor said. "The F-16 program has become a major milestone in the cooperation between the governments of the United States and Thailand."

The RTAF will be the first air force in Southeast Asia to operate the F-16 in-country. Singapore is flying its F-16s in a training program at Luke AFB, Ariz., and Indonesia will receive its first Fighting Falcons next year.

Sixteen nations have placed orders for approximately 3,000 F-16s, and plans are to produce more than 4,000 aircraft. The worldwide F-16 fleet is approaching two million flight hours.

## Space Systems Wins GOES Launch Contract

Space Systems Division has been awarded a \$200 million contract from NASA and the Department of Commerce to launch three satellites for the Department's National Oceanic and Atmospheric Administration (NOAA).

Space Systems will supply Atlas I launch vehicle services for NOAA's new family of Geostationary Operational Environmental Satellites (GOES) I, J and K, with an option of \$103 million for two additional satellite launches, GOES L and M. The first launch is targeted for March 1990.

In a joint statement, NASA's Associate Administrator for Space Flight, Rear Adm. Richard H. Truly, and NOAA's Assistant Administrator of Satellite and Information Services, Thomas N. Pyke Jr., said, "NASA and the Department of Commerce are proud to make aerospace history with the initiation of commercial launch services."

The contract marks the first time a contractor will assume systems performance responsibility for overall program and subcontractor management, vehicle design, production, testing and vehicle-to-payload integration,

mission integration, launch services, system effectiveness, overall launch vehicle performance and mission success.

GOES spacecraft provide near-continuous, high-resolution visible and infrared imaging of weather systems over large areas of the earth. They are especially valuable in identifying hurricanes and other major storms at an early stage and in providing critical data needed on a routine basis for weather forecasting.

In a related matter, NASA has recently agreed to allow Space Systems to use Launch Complex 36 at Eastern Space and Missile Center, Cape Canaveral, Fla., for commercial launch operations of the Atlas I and II. The agreement covers the terms and conditions for the operation and maintenance of the facilities by Space Systems and the use of payload processing facilities where appropriate. Space Systems will pay all costs associated with facility maintenance and operation. Space Systems assumed operation of the pad on April 1st.

NASA and the Department of Commerce announced in October 1987 the selection of Space Systems for negotiations leading to award of expendable launch services for GOES.

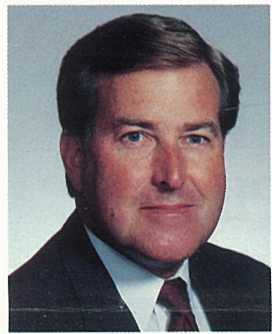




**Model Presentation Made.** Dr. Alan M. Lovelace (right) Vice President and Space Systems General Manager, presents an Atlas II model to Edward C. Aldridge Jr., Secretary of the Air Force. The Air Force has selected the Atlas II for its Medium Launch Vehicle-II program. Atlas II will launch 11 defense communication satellites starting in 1991.

## Hancock Gets New Vice President Post At Fort Worth

Dain M. Hancock has been named to the newly created position of Vice President - Program Development at Fort Worth.



Hancock will be responsible for all new-business related functions, including product planning, market analysis and development, program definition and communications.

Hancock, 46, will also direct the division's efforts toward the formulation of new programs in the United States and internationally.

**Hancock** A graduate of Texas Tech University with a Master of Science degree in Engineering, Hancock began his career with General Dynamics in 1966. Since then, he has held increasingly important positions in various program management functions and most recently was Vice President of the division's international operations.

## New Systems Added To Corporate Network

Data Systems Division has added six additional audio/video freeze frame teleconferencing systems to the existing corporate network. This freeze frame equipment can transmit and receive documents or images within camera range to like systems anywhere in the world.

The new systems are located at Data Systems Division Headquarters, Central Center, Western Center, Eastern Center, Pomona/Valley Systems and the Land Systems Office. Compatible units are also located at the Corporate Office, Fort Worth, Convair and Land Systems. Teleconferencing schedulers and project leaders are assigned at each of these locations to answer questions on the systems.

## SINGARS . . .

(Continued from Page 1)

world's leaders in tactical communication systems and a major provider of tactical radios to the U.S. Army. As the prime contractor, Electronics will incorporate Tempest and communication security devices into the system and will be responsible for final integration and selloff to the Army. The Army will use the high security, multi-frequency SINGARS for critical voice and data communications on the battlefield.

The production and assembly program will be carried out in Tallahassee, Fla., as announced in September 1987. It is projected that 700 people will be working on the program when full production is reached in 1992. That work force will be split between Electronics Division and Tadiran, who will occupy separate facilities in Tallahassee.

## Current & Comment

*(Observations on news of interest to the company and the industry will appear regularly in this column.)*

**NO RESPECT** — Air/Space America President Bill Walsh's "biggest surprise" at that first-ever San Diego event last month was the covert arrival by dawn's early light of 4,000 first-day, non-paying spectators who filled the VIP parking lot and bleachers before the gates opened.

Walsh, who spent his last two years organizing the international air show, was subsequently turned away by guards at the overflowing car-park and forced to shuttle in from a remote lot. "A tough way to begin a new exposition," Walsh laughed. (Reported in *Armed Forces Journal*)

\* \* \*

**TELE-COUNSELING** — Two young members of GD-Fort Worth's Cooperative Education Program recently interviewed Chairman Stan Pace via a teleconferencing hookup with St. Louis. Pace had high praise for the Co-op Program and offered Chad Watts (Mississippi State Univ.) and Scott Stewart (Univ. of Arkansas) this career advice: "The most important quality is not only the willingness to accept responsibility, but the desire."

"The basic advantage of the co-op program is that it allows the student to see what the workplace is like," Pace said. "The program motivates students to learn more from their academic studies. I'm a great believer in education and that includes graduate studies."

\* \* \*

**AVIATION AFFICIONADOS** — GD-built aircraft will be featured in two episodes of a six-part cable TV

series entitled "Great Planes," starting next month on The Discovery Channel. This history and development of warplanes debuts July 5th (11 p.m. EDT) and July 8th (7 p.m. EDT) with the story of the F-111; the fifth show on Aug. 2nd (11 p.m. EDT) and Aug. 5th (7 p.m. EDT) features the front-line F-16 Fighting Falcon.

\* \* \*

**AFTER NOVEMBER** — In a June 6 *Newsweek* condensed article entitled "An Agenda for 1989," GD Board member Cyrus Vance (together with Henry Kissinger) writes: "... presidential candidates of both parties should describe ... their visions of America's world role. They should explain which international commitments they would reinforce, reduce or reallocate to others. We hope they recognize that the U.S. has made certain commitments in pursuit of vital interests which cannot be redefined on the basis of transitory fashions."

By way of illustration, the two former Secretaries of State note: "America ... has an obligation to ensure that willingness to defend freedom and justice is not impaired by U.S.-Soviet negotiations that raise unrealistic expectations."

\* \* \*

**READY OR NOT** — Nostradamus notwithstanding, a recent front-page story points out that in just five billion years the sun "will slowly swallow the Earth in a huge fireball." It isn't clear which is to blame: a straying planet Earth or an expansionistic-minded sun. Calls to the cited authority for additional details on this dire event were equally disturbing. "This is galactic. You want planetary," we were told. A call to another number produced a taped, but understandable message: "Planetary is on travel."



**Seminar Held for Financial Officers.** Standley H. Hoch, Executive Vice President and Chief Financial Officer, opens the Advanced Financial Management Seminar I, held at Washington University's John M. Olin School of Business in St. Louis in June. About 40 financial executives from throughout the company attended the seminar. Seated to Hoch's immediate right is Robert L. Virgil, Dean of the School. Standing in back of the top row of seats is James T. Little, Associate Dean, and seated to his left is Murray L. Weidenbaum, Director of the University's Center for the Study of American Business and President Reagan's first Chairman of the Council of Economic Advisers. Weidenbaum conducted the seminar's first session on "The Federal Budget and the Defense Industry." Faculty members from the business schools at Harvard, Stanford, Northwestern, MIT and Washington universities conducted the week long seminar.

## F-16s Win USAFE Bombing Competition

The F-16 continued its string of winning every major bombing competition it has entered by finishing first in the recent Excalibur III bombing competition held among tactical fighter units in the U.S. Air Force in Europe (USAFE).

An F-16C team representing the 50th Tactical Fighter Wing at Hahn Air Base, West Germany, topped the overall standings in Excalibur III. In second place was an F-16C team from the 86th TFW at Ramstein AB, West Germany, and third was won by F-16A pilots representing the 401st TFW at Torrejon AB, Spain.

The competition's Top Gun was Maj. Greg Findlay of the 86th TFW. Seven teams participated in the competi-

tion. Other aircraft flown included the A-10, F-111E and F-111F. Europe-based F-15s provided adversary aircraft support, and RF-4s provided reconnaissance support.

F-16 pilots won all the individual weapons-delivery events.

Excalibur is similar to the Tactical Air Command's semiannual Long Rifle competition. To enhance realism, four pilots are randomly selected from each wing on short notice. They fly missions of more than 3½ hours from their home bases, utilize inflight refueling and perform bombing and strafing runs before landing at the host base, RAF Lakenheath, England.



# Discipline Underscores the Seriousness of the Ethics Program By Julie C. Andrews

Employees often ask: "Whatever happens to individuals who are proven to have violated the Standards of Business Ethics and Conduct? Does the ethics program have teeth or is it just window-dressing?" This article describes sanctions imposed in 1987 for violations of the Standards. It follows an article in the April issue of *General Dynamics World* that describes the numbers and types of communications received by the Ethics Program directors by way of the hotlines and other means.

Sanctions that result from violations of the General Dynamics Standards of Business Ethics and Conduct are difficult to discuss because of some sensitive matters.

First, specific details must be omitted in reporting about sanctions to protect the identity of individuals involved — a basic commitment of the company's ethics program. Second, in talking about violations and sanctions, it may appear that all similar behavior should require the same sanction, when, in fact, each case is unique. Third, reporting about sanctions may leave the impression that discipline is the only reason for the ethics program.

"The purpose of the General Dynamics ethics program is to help employees in their everyday business activity, not to catch them at wrongdoing," said Kent Druyvesteyn, Staff Vice President-Ethics Program. "However, violations of the Standards of Business Ethics and Conduct are serious matters, and sanctions are necessary for the credibility of the program."

When allegations of misconduct are raised with Ethics Program directors, it becomes their responsibility to set in motion a fair, accurate and timely investigation according to the provisions of Corporate Policy and Procedure 23-103, "Investigations and Sanctions-Business Ethics and Conduct."

All investigations require establishing the facts by asking: What actually happened? What is the issue? What is the charge? The goal of the investigation is to correctly identify the concern and get the facts that either answer the question or substantiate the concern. Management then has the responsibility to determine fair discipline where called for.

Monthly reports are compiled with all names and location references deleted from the data. In 1987, 205 sanctions were imposed corporatewide as a result of allegations received by Ethics Program directors. These were not the only sanctions imposed throughout the corporation. They represent only those that were reported by way of the

ethics program. Others arise through industrial security, legal or internal audit.

Nearly half of the 205 sanctions were related to the standards on time card reporting or abuse of company or customer resources. In time card reporting, for example, the kinds of behavior leading to disciplinary action were improper charging, ranging from careless use of charge numbers to willful recording and collecting overtime not actually worked. Other cases involving time cards included a supervisor signing in an employee who was not actually present, employees leaving early but charging a full eight hours and an employee altering a time card after it had been signed.

Cases related to company and customer resources recorded the second highest number of sanctions and included using company mail for personal business, making numerous copies of a personal document on company equipment and abusing company telephones through excessive personal use. Other misconduct ranged from stealing company supplies for personal use to theft of major company assets.

Other situations that led to sanctions in 1987 included company representatives accepting improper gratuities from suppliers, a supervisor publicly humiliating a subordinate, disclosure of private information improperly obtained, falsification of a travel expense report, false entries on test data and misuse of the ethics program by deliberately making false accusations against a fellow employee.

The charts below show the number of sanctions by standard and by type.

SANCTIONS IN 1987  
BY STANDARD

Standard	Total Sanctions
Gifts, Gratuities & Entertainment	0
Inside Information	0
Outside Interests	9
Former Government Employees	0
Selling & Marketing	1
Antitrust	0
Pricing, Billing & Contracting	2
Time Card Reporting	57
Suppliers & Consultants	19
Quality & Testing	13
Expense Reports	13
Company & Customer Resources	52

Security	0
Political Contributions	0
Environmental Actions	0
Safety & Health	1
International Business	0
Proper Use Of Ethics Programs	3
Employee Relationships & Other	35

SANCTIONS IN 1987  
BY TYPE

Type	Total
Warning	77
Reprimand	62
Probation	0
Demotion	3
Temporary Suspension	29
Discharge	27
Required Refund For Losses Or Damages	7
Referral For Criminal Prosecution Or Civil Action	0

In general, the severity of the sanction depends on the seriousness of the offense. In all cases, sanctions are imposed in accordance with company regulations and the applicable collective bargaining agreements. In cases where the misconduct has had an adverse impact on the customer, the government is notified and reparations are made as necessary.

"The challenge for management in imposing sanctions is to balance consideration for the individual and the unique circumstances of each case with the demand for justice and consistency," Druyvesteyn said.

This process depends on variables such as the nature of the offense, the individuals involved, their previous history or anything else that is an aggravating or mitigating circumstance.

"Sanctions are not the bottom line of the ethics program, but they are necessary for the program to be effective," Druyvesteyn said. "Even though the overwhelming number of General Dynamics employees act responsibly in their daily business activities, occasionally there are individuals who knowingly and willfully do what is wrong despite codes of conduct, policies and procedures, and even laws. The 1987 record shows that violations of the Standards of Business Ethics and Conduct are treated seriously and firmly."

## Space Systems Gives New Nomenclature To Launch Vehicles

With the award of the Air Force Medium Launch Vehicle-II program to Space Systems, the company said goodbye to Atlas/Centaur and hello to Atlas II by instituting new nomenclature for its entire family of launch vehicles.

Since the early 1950s, the Atlas missile has undergone continuing modification and growth in response to the changing requirements of the U.S. space program. The first version of the Atlas missile was designated Atlas A. Subsequent configurations of the Atlas carried succeeding alphabetic qualifiers.

In 1957, the company began development of the high-energy Centaur upper stage, which was used in combination with various Atlas vehicles and the Titan III to launch a variety of lunar and interplanetary missions. Over the years, new Centaur configurations were also designated with new alphabetic and numeric qualifiers.

From now on, all Atlas vehicles incorporating a Centaur upper stage will be designated "Atlas" followed by a Roman numeral to differentiate configuration. All references to Centaur will be dropped. The General Dynamics MLV-II vehicle is designated Atlas II. The 18 launch vehicles being built for commercial users are called Atlas I. A planned commercial growth version of Atlas II will be known as Atlas IIA.

All Atlas vehicles without a Centaur upper stage will continue to be called "Atlas" with an alphabetic qualifier based on configuration. Atlas E, for example, does not carry a Centaur upper stage. Atlas Es are the former ICBMs modified for space launch missions at Western Space and Missile Center, Vandenberg AFB, Calif. Space Systems is studying Atlas J, a stretched Atlas booster without a Centaur upper stage but with the avionics hardware normally carried in the Centaur stage.

The wide-body Centaur upper stage that is being developed and built for the Air Force Titan IV program will continue to be called Titan/Centaur.



**Ribbon-Cutting at Columbus Operation.** Attending the ceremony are (left to right): L. David Blair, Economic Development, City of Columbus; Paul R. Salopek II, TPS Program Manager, Columbus Operation; John S. Christie, President, Columbus Area Chamber of Commerce; Melville R. Barlow, Vice President and Electronics Division General Manager; Keith E. Henry, Executive Assistant to Dana Rinehart, Mayor of Columbus, Ohio; and Michael R. McCarthy, Vice President of Economic Development, Columbus Area Chamber of Commerce.

## Electronics Division Holds Ribbon-Cutting For New Facility Called 'Columbus Operation'

Electronics Division representatives and Columbus, Ohio, civic officials joined together May 24th for the grand opening of a new facility that will be called the Columbus Operation.

The new facility will be responsible for the design, development and integration of Test Program Sets (TPSs) for military avionics and electronics.

Test Program Sets are used with computer-controlled, automated test systems manufactured by Electronics that provide maintenance support of complex weapon systems such as the F-16 Fighting Falcon and the B-1B bomber. Each TPS contains software coded instructions that con-

trol test procedures and evaluate test results.

The Columbus Operation occupies approximately 6,000 square feet of space in the new Lionmark Corporate Park. About 20 engineers and engineering support personnel are currently staffing the facility and that number is expected to increase to more than 100 over the next two years.

Columbus was chosen as the site for the new facility because of its highly qualified labor force, its proximity to military customers, a moderate cost of living and conducive business environment. The facility will use automated TPS development tools to achieve a highly efficient and cost effective operation.



**Companywide Employee Survey Reports** Compiled by Sue L. Shike

**Many Employees Favor Drug Program; Company Responding with New Policy**

Recognizing the need shown by the employee survey for alcohol and drug abuse counseling and rehabilitation, General Dynamics has been formulating an improved policy on alcohol and drug abuse.

The policy under consideration incorporates employee survey and consultants' reviews and reports. This information convinced the company that the policy should address BOTH alcohol and drug abuse. The company and its many unions are negotiating various aspects of this policy.

Any policy will be based on a fundamental need to educate, train, assist and rehabilitate employees. The policy will likely contain deterrents such as limited testing for alcohol or drugs. Disciplinary action for employees selling or using alcohol or drugs on company property or who come to work subject to the effects of alcohol or drugs will continue to be a part of

our policy.

The largest percentage of employees who responded to the survey section on drugs said drug testing would be accepted if that was required to remove drugs from the workplace.

To ensure the highest integrity and quality of testing, the company has investigated all aspects of drug testing from specimen collection and control through laboratory procedures and confidentiality of test results. The final selection of a laboratory to conduct tests will be based on the laboratory's demonstrated quality of performance, internal quality control programs and participation in outside quality reviews.

The policy is expected to be issued later this summer. Additional articles in *General Dynamics World* will detail specifics of the program as it evolves.

**Delegation of Authority Policy Issued**

One of the administrative improvements suggested by the employee survey was for corporate officers to delegate approval authority to someone in their functional area to act on their behalf when they are out of the office.

After a careful review, a new Corporate Policy and Procedure, CPP 3-202, "Delegation of Authority and

Assignment of Responsibility," was issued April 21st. It provides for corporate officers to delegate certain responsibilities. These approval changes, along with others previously announced, represent significant reductions in the amount of corporate oversight from a year ago.

**Salaried Employee Jobs Reviewed**

Task force recommendations have been approved to adjust the salary grades of approximately three percent of 4,911 positions containing 43,000 salaried exempt employees.

Since the fall of 1987, the task force has been working with division and corporate function heads reviewing salaried exempt jobs, salary grade slotting and titles to determine whether revisions were needed. Each division reviewed its salaried positions and sent recommendations to the task force, which compared the results across the corporation and with other similar companies. The recommendations from the job slotting study were re-

viewed with Chairman and Chief Executive Officer Stanley C. Pace and President and Chief Operating Officer Herbert F. Rogers in mid-May.

Additionally, in many cases titles for the same job are different from division to division, and in some instances are different from department to department within the same division. Therefore, the task group was directed to continue its efforts toward consistency in job titles among the divisions and Corporate Office. Once this is accomplished, the number of job titles should be reduced significantly.

**Corporate Approval Levels Changed**

Study results and recommendations approved recently by the Executive Office will reduce the number of personnel actions requiring corporate review and approval by more than 60 percent.

Corporate Office approval of personnel actions involving salaried employees at the divisions had been required at certain salary levels. The study tried to determine if some of the salary levels requiring Corporate Office approval could be delegated to the divisions to save time while still maintaining necessary communication to cor-

porate management.

As a result of the study and the executive office review, the P-3 approval level has been changed. The Corporate Office will review and approve all division personnel actions for General Managers, direct reports to General Managers, Vice Presidents and other division incentive compensation eligible employees. Division general management will review and approve personnel action recommendations for all other division salaried employees.

**W.G. Phillipp Named Div. Vice President At Space Systems**

William G. Phillipp has been appointed Division Vice President-Medium Launch Systems at Space Systems. He will be responsible for the overall program management of Atlas I and Atlas II launch vehicles.



Phillipp has been with General Dynamics for 32 years and has had assignments in both engineering and program management. He began his career at Convair in 1956 when space programs were still part of that division. He held a series of engineering assignments associated with launch vehicle programs until 1976 when he was named Director of Test and Evaluation for all Convair programs. He was appointed Program Director for Atlas Programs in 1985 and Program Director for Atlas and Atlas/Centaur Programs in 1987.

Phillipp earned a Bachelor of Science degree in Electrical Engineering from Indiana Institute of Technology in 1956.

**Three Subcontractors Are Named for A-12 By GD/McD Team**

Subcontractors for three additional major aircraft components were announced recently by the General Dynamics/McDonnell Douglas team that is designing the A-12 Advanced Tactical Aircraft for the U.S. Navy.

The firms are Martin Marietta, Sundstrand Turbomach and the Garrett Auxiliary Power Division of the Allied Signal Corporation.

Martin Marietta was awarded a contract to develop and test the navigational FLIR (Forward Looking Infrared) system for the A-12.

Sundstrand Turbomach Division of Sundstrand Corporation will develop and test the auxiliary power unit.

Garrett will develop and test the airframe mounted accessory drive gearbox system. Long-range Navy plans call for Martin Marietta, Sundstrand and Garrett to develop second sources in the early phases of the program for a competitively shared production during the later phases.

The A-12 will be a replacement for the A-6 Intruder, an all-weather attack aircraft based aboard aircraft carriers.

**Savings and Stock Investment Plans**

	Annual Rate of Return for the 12 Month Period Ending:		
	April 1986	April 1987	April 1988
<b>Salaried</b>			
Government Bonds	16.2%	6.5%	7.5%
Diversified Portfolio	39.6%	28.6%	(7.9)%
Fixed Income	12.2%	11.9%	11.1%
<b>Hourly</b>			
Government Bonds	15.6%	6.8%	7.7%
Diversified Portfolio	39.9%	30.2%	(8.1)%
Fixed Income	12.3%	11.8%	11.0%
<b>GD Stock Closing Price</b>	\$79.37	\$64.00	\$54.87
( ) Negative number			



**Vice President Visits Company Exhibit.** Vice President George Bush officially opened the Air/Space America trade exposition in San Diego, Calif., on May 13th with a speech stressing the importance of a strong American aerospace industry. The Vice President visited one of the exhibition pavilions and greeted many of the General Dynamics employees staffing the company's large exhibit. Bush (red jacket) is shown shaking hands with Gerald M. Littman, Communications Representative at Valley Systems.

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## Employees Who Need Specialized Care Know Alice M. Cartledge By Joe Stout

Fort Worth's Alice M. Cartledge has earned the right to have titles both before and after her name in official usage.

What she values more, though, is the fact that she has earned the compliment of having hundreds of employees and their family members call her "Alice" in one-on-one consultations with them as the Individual Case Management representative in Fort Worth's Employee Services Department.



In her professional life at the division, she is Alice Cartledge, R.N., F.N.P. (Registered Nurse, Family Nurse Practitioner). On weekends in the Air Force Reserve, she is Colonel Cartledge, Chief Nurse of the 20th Medical Service Squadron at Carswell AFB, Tex., with more than 130 people under her command.

She said she enjoys both jobs and that they complement each other.

The philosophy of Individual Case Management is to get the best possible care for General Dynamics employees and their families, Cartledge said. She deals primarily with

catastrophic or terminal illnesses and injuries that require long-term, costly care and treatment.

"My role is to let the patient and family know what all their care options are and to assist them in understanding their insurance coverage so that they can get the greatest possible benefit from it," she said. "Specialized care for serious illnesses can cost many thousands of dollars per month, eventually stretching to the limits of normal coverage," she explained.

Cartledge's assistance usually includes personal visits with her clients, often in their hospital rooms. Making these visits has proved to be one of the more satisfying aspects of the job, she said. "It's always a pleasure to see the happy surprise of the patients when they learn that someone representing the company has come to see them, to see how they're doing," she said.

Cartledge handles between 95 and 130 cases each month, but it would be impossible for her to see every employee or dependent who is ill or hospitalized, she said. "Therefore, I try to concentrate on certain diagnoses: strokes, spinal injuries and diseases, nervous diseases, burns, auto accident injuries and other serious illnesses," she said.

Hospice care for the terminally ill and adult day-care for stroke patients are examples of the types of alternate care she may suggest both for savings and for the benefit of the

patient. "People tend to be more comfortable and do better when they can be at home instead of in a hospital," she said. In other cases, she may suggest a change to care or treatment that is more expensive, if she feels it will be of benefit to the patient.

Cartledge estimates that her assistance in finding the best care solutions for patients has saved several million dollars in medical expenses in the last few years — allowing them to get more care for their benefit dollars. She was subsequently presented Fort Worth's first-quarter 1988 Cost Reduction Award for administrative departments.

Her job in the Air Force Reserve is a welcome respite from her company duties "because it has nothing to do with illness," Cartledge said. "It has to do with management."

Cartledge previously served as an active-duty Air Force nurse in hospitals and clinics. After leaving the active Air Force, she completed her F.N.P. certification at the University of Texas at Arlington and joined the company in 1982.

She admits that her position with the company involves a certain amount of emotional stress, since she often deals with people and families of people who are dying. "I know I cannot take away disease, but I can help patients get the very best care. And that's how I handle it," she said.



**Gold Knight of Management.** Ralph E. Hawes (right), Executive Vice President-Missiles and Electronics, received a special award from the Inland Empire Area Council of the National Management Association (NMA). He was cited by R. W. (Dusty) Brown, NMA Board Chairman, for his initiative, creativity and hard work. Hawes was formerly Vice President and General Manager at Valley Systems and Pomona. The Gold Knight of Management Award is the highest honor that an NMA Council can bestow.

## Convair Ends Production of DC-10 Fuselages; Assembly Line Switches to Fuselages for MD-11

Convair delivered the last DC-10 fuselage on schedule to McDonnell Douglas on May 13th, just three months short of 20 years after signing of the original fuselage contract.

The delivery brings to a successful close the production of both DC-10 fuselages and KC-10 fuselages for the Air Force tanker/cargo version.

Since 1970, Convair has delivered 387 DC-10 fuselages and 60 KC-10 fuselages.

Production has begun at Convair on the MD-11 fuselage for the new McDonnell Douglas wide-body aircraft, an extension of the DC-10/KC-10 fuselage program.

Convair will deliver the first of 200 MD-11 fuselages around Aug. 1st. The first flight of the MD-11 is scheduled for next March.

The MD-11 is a stretched and improved version of the DC-10. The longer fuselage will be produced by adding two short fuselage sections to the three major sections now delivered for the DC-10.

New fuel efficient engines, combined with aerodynamic improvements to the wing, tail and tailcone, plus use of advanced metals and composite material to save weight, give the MD-11 considerable range and economic improvements over the DC-10.

With standard two-class seating for 323 passengers, the aircraft's nonstop range is 6,880 nautical miles.



A Major Assembly for MD-11 Fuselage Number One

## New Efficient Painting System Is Friendly to the Environment By Joe Stout

Fort Worth recently began production operations with a new painting system that increases productivity, reduces paint use and contributes to the division's environmental resource management efforts.

Since less waste paint is discarded in the new system, it is considered more friendly to the environment. The system, called the proportional painter, automatically mixes water, paint base and paint catalyst while an operator uses it to apply primer coats to F-16 parts in the factory, according to James B. Phipps of Industrial Engineering. Phipps worked with L. Sue Caldwell of Advanced Manufacturing Technology and Randy D. Mason, General Foreman of the factory Detail Paint Area, in system development and installation.

Operators favor the system because it eliminates the time-consuming and sometimes messy task of hand-mixing water-reducible primer in a pressure pot, Mason said.

In simple terms, the system draws paint elements from three containers and mixes them in a manifold and tube as the operator applies paint with a spray gun. A similar system has been used with two-component paints, but previous attempts to design such a system for three-component paints had not been successful enough for production use, Phipps said.

The system replaces the conventional method of mixing the paint manually several times a day, a task that temporarily halts painting. Water-reducible primer has a usable

life of only about four hours, so unused paint must be discarded periodically when using the conventional procedure, Phipps said.

"With the older method, we have to throw away a significant amount of paint," Phipps said. "The new system greatly reduces primer use."

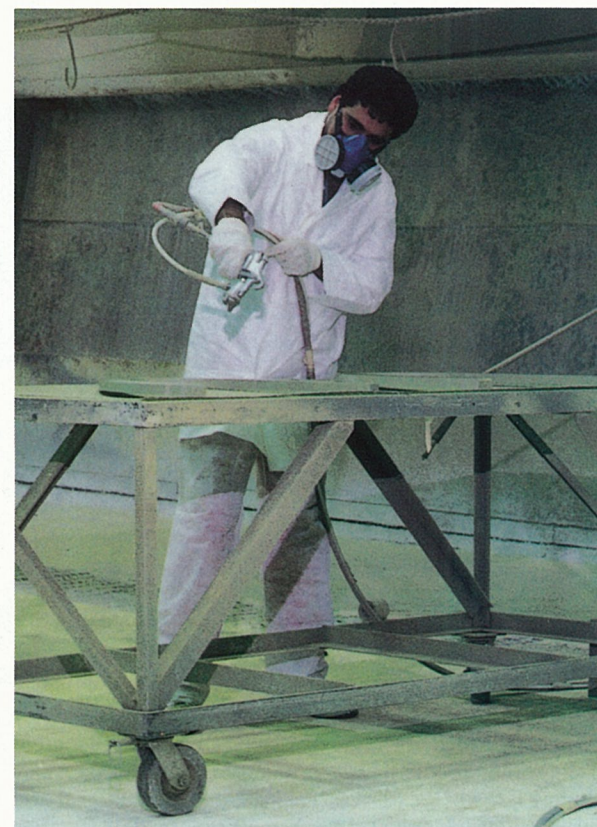
Besides saving paint, the new system reduces costs to dispose of waste paint. Waste paint is considered a hazardous material that must be disposed of properly, Phipps said.

Another advantage of the system is that it can be used by different operators through three shifts with no need to stop for mixing. The equipment is easily cleaned by circulating thinner-fluid through its tubes.

Fort Worth has two systems and is planning to add others. The equipment was built to Fort Worth's specifications by a subcontractor. It is used on a variety of F-16 parts, from very small ones to ones the size of aircraft skins.

"We think this is the coming thing in industrial painting," Phipps said.

Fort Worth began using water-reducible paint in F-16 production about two years ago to reduce factory emissions of volatile organic compounds, which are materials that can contribute to air pollution, according to William C. Rosenthal, Manager of Environmental Resources Management.



**New Painting System.** Aircraft painter Andrew Ybarra III primes F-16 parts in Fort Worth's Detail Paint Area.



## Pomona's Special Olympians Use Their Intellects to Win Medals By Larry W. Elwell

David Hand is a champion. He has a chestful of medals from many Special Olympics events and a wall full of plaques and certificates at home. He proudly exclaims that he is one of the fastest runners in his class.

But the one medal that is most cherished is not for athletics; his most valuable medal is the one he received for using his mind.

Hand, along with 20 classmates who are mentally handicapped, participated in the first Special Olympics science fair to be held anywhere.

The science fair was an outgrowth of Pomona's National Management Association's (NMA) efforts to revive student interest in the Pomona School District science fair. The division support for the district's event signaled the first corporate involvement in the project.

The Special Olympics science fair was the concept of buyer Paul Woodward, who developed the idea while working with the school district's science exhibition and after talking to his neighbor and David's mother, Dorothy Hand.

"Dorothy and I came up with the notion that it would be great if we could do something with academics for these kids," he said. "We thought that it would be a real boost to their self-esteem if they could receive a medal and say, 'I won this for something I created.'"

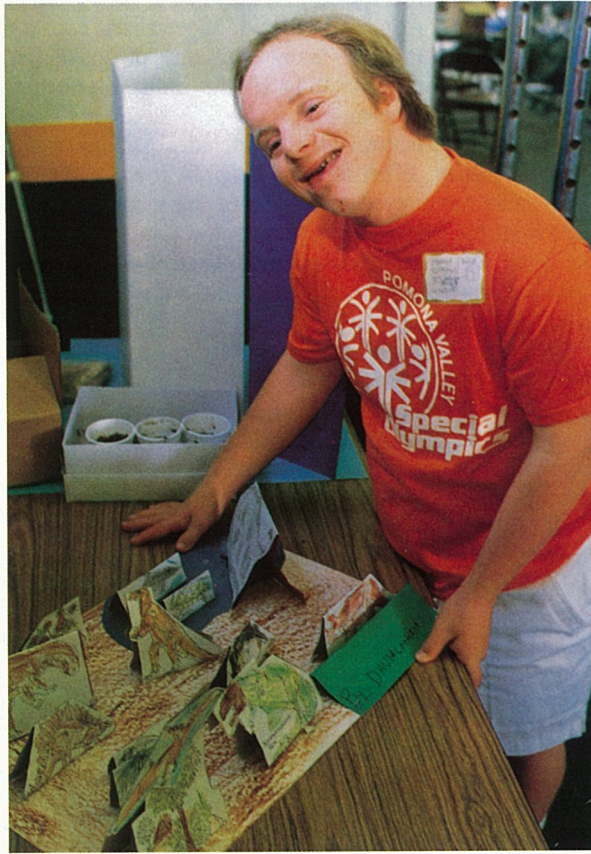
To get his idea rolling, Woodward approached James Moore, Project Engineer-Phalanx. Moore, the director of American Enterprise for the Pomona NMA, was in charge of staging the regional science fair for the district.

"Paul came to me with his idea and asked why don't we have one for these [Special Olympics] kids too," Moore explained. "I told him it was a great idea, so we went to the ConTrib Club and they gave us \$1,000 for medals and T-shirts."

"The program shot off from there," Woodward said.

"Dorothy enlisted the help of David's teacher and the whole class got involved in creating science projects."

David's teacher, Ida Spuhler, decided the best way to help the children create their science project was to seek



David Hand and His Science Project

assistance from the students in the Gifted and Talented Education (GATE) classes.

Spuhler said the GATE students provided the leg work to create the science projects, but the ideas to create them belong solely to the Special Olympians.

Spuhler said she was not surprised by the outpouring of volunteers from the GATE class. "I get more volunteers, especially the GATE kids, than I know what to do with," she said.

When the weekend of the science fair arrived, the 20 children from Spuhler's class joined in the exhibition with the 60 other students. Woodward said there was no special category for the Olympians and that all the events were judged according to their grade level.

"Instead of separating these kids, we decided to let them compete with those students who are on their level. In other words, if an Olympian is on a second-grade level, then he will compete with the second-grade kids," Woodward said.

He added that David and his classmates will be able to display the science projects this fall at the Los Angeles County Fair.

"Overall, the science fair was successful," Moore said. "We had 60 finalists from the school district, and next year there are plans to have possibly 1,200 entrants."

"The only thing that is holding us back is space," Woodward said. "We hope the county will let us use one of the exhibition halls at the fairgrounds next year for the regional science fair."

Moore said the next step for NMA is to join with the National Science and Engineering Association and help sponsor science fairs for most of Southern California.

"We are revitalizing student interest in science, and I see this expanding quickly among the school districts and the Special Olympians," Moore said.

## First International Sale of M1A1 Abrams Tanks Draws Closer By Donald L. Gilleland

The sale of 555 M1A1 Abrams main battle tanks to Egypt, recently cleared by Congress, opens the way to the first international sale of the vehicle by Land Systems.

The Department of Defense formally notified Congress on April 15th that the U.S. Government intended to participate with Egypt in a coproduction program that would allow Egypt to equip its army with 555 M1A1 tanks.

Congress has allowed the sale to proceed, and the U.S. and Egyptian governments must work out details of the program in a Memorandum of Understanding and a Letter of Offer and Acceptance, which could occur late this year or in early 1989.

"This program is very important to us because the U.S. Army tank requirements drop from 840 units per year to 720 in 1988," said Robert W. Truxell, Vice President and Land Systems General Manager. "The Egyptian tank program is an increase over U.S. Army needs and will help keep M1A1 production operating at an economically efficient rate."

Michael W. Wynne, Vice President-Marketing, said, "The Egyptian program will provide an assured backlog of orders and stable production to which future international sales can be added. Canada, Great Britain, Pakistan and Saudi Arabia are also interested in the M1A1, and Land Systems is optimistic that the Egyptian sale will be

the first of many international orders."

The Egyptian program calls for Land Systems to deliver 15 complete tanks in 1990, followed by coproduction of 540 tanks over 10 years beginning in 1991. Egypt would assemble the tanks from kits produced in the U.S. at first, eventually phasing into manufacture of a few components such as sprockets, road wheels and tracks. However, the Egyptians will not produce components containing critical or classified technologies, such as the armor, engine, transmission or fire control system. These sensitive items will continue to be produced exclusively by U.S. industry.

Tanks assembled in Egypt will be used only by Egyptian armed forces. The Egyptians will not build any tanks for the U.S. Army and will be restricted from selling any tanks assembled in Egypt to other countries without the prior approval of the U.S. Government.

The Egyptian M1A1 program will generate at least \$1.6 billion in direct and indirect income for the American economy and create a minimum of 52,000 man-years of employment in the United States.

About 26 percent of the economic benefit will go to Michigan, 17 percent to Ohio and 4 percent to Pennsylvania, states in which Land Systems has manufacturing facilities.

As planned, 81 percent of total work for the 555 M1A1s

will be retained in the United States. The economic impact includes the Land Systems vendors and suppliers throughout the country.

To the U.S. Army, the estimated benefits in recoupment and rental fees total \$173 million. Estimated federal and state tax revenues total about \$405 million. In addition, cost savings will accrue to the U.S. Army budget as a result of the increased procurement quantities for the Egyptian program. Because the components procured and/or built for Egypt will be common with those in U.S. Army tanks, the larger quantity buys will yield significant savings to the U.S. Army.

For the United States, the benefits extend beyond additional revenue and employment. The Egyptian M1A1 program will also show continued support for a strong and stable ally in a highly volatile region, keep the M1A1 line operating at an efficient rate and establish a logistics support network that could prove important for any future Abrams deployments in the Middle East.

Egypt will coassemble the tanks at a facility under construction 30 miles outside Cairo. The facility, that is being built to refurbish, service and maintain some 900 M60A3 tanks that Egypt purchased from Land Systems in recent years, will also contain space for assembly of the M1A1s.



**Exploring the World of Business.** General Dynamics employees in the St. Louis area are taking an active part in bringing the complexities of computers and business to two groups of Explorers. At left, members of Explorer Post 9674, sponsored by the Data Systems Division, are given hands-on training with computers at DSD headquarters at Woodcrest. Timothy E. Cox (leaning over terminal), Administrative Financial Analyst and post adviser, gives the Explorers some fine points in computer operations, the group's area of interest. He is assisted by Dennis J. O'Rourke (directly behind Cox), Instructional Methods Specialist, and Larry R. Page (standing at right, background), Manager of Training and Development. At right, members of Explorer Post 9673, sponsored by the Operations Department at the Corporate Office, tour the facilities of the Bridge Trading Company to learn about the New York Stock Exchange. Charles Lebens (at far right), discusses his company's operations. Post adviser Robert J. Burns (third from right), Manager-Corporate Headquarters Facilities, and Robert L. Gallo, associate adviser (second from right), Corporate Director-Facilities, organized the tour. Post 9673 concentrates on business management.



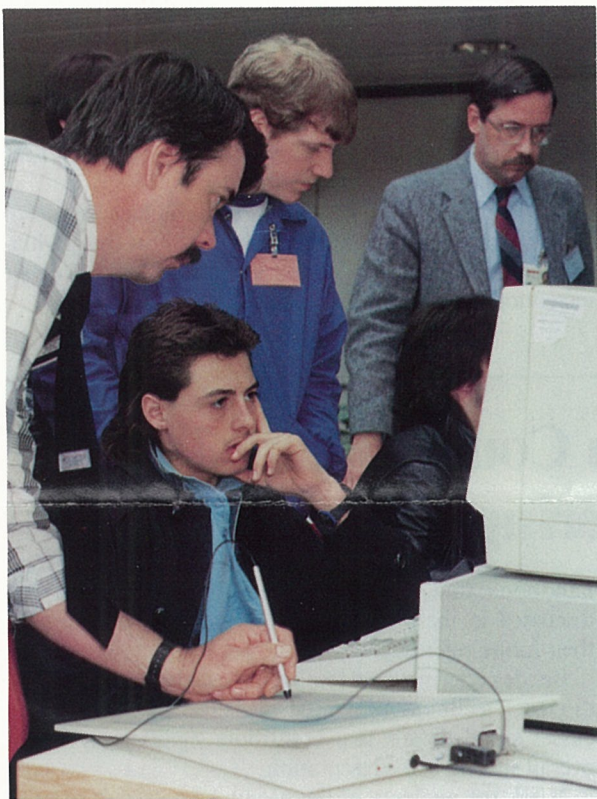
## U.S. Army Exercises Its Option for 1,050 Stinger-RMP Rounds

The U.S. Army Missile Command (MICOM) has exercised its option and has purchased an additional 1,050 Stinger-RMP (Reprogrammable Microprocessor) rounds from Valley Systems Division under terms of the recently awarded multiyear contract.

The option raises the amount of the multiyear contract from \$665 million to \$695 million for the production and delivery of 20,514 Stinger-RMP missile rounds. The deliveries are scheduled to begin in 1989.

Under terms of existing contracts, the division will be producing more than 27,000 missiles through December 1991. The first Basic Stinger contract was awarded to General Dynamics by MICOM in 1978. Since that time, more than 16,000 rounds of Basic Stinger and Stinger-POST (Passive Optical Seeker Technique) plus training sets and spares have been produced at Valley Systems facilities, including the rounds produced when the facilities were operated by Pomona.

Stinger is the premier man-portable shoulder-fired, forward-area air defense system in the world. It allows the user to provide immediate air defense at or near the forward edge of the battle area.



**Career Counseling.** Area students attending a career exposition at Electric Boat were given a computer demonstration by James H. Andrews (holding computer wand), Senior Engineering Assistant in Computer-Aided Design (CAD) Services, and Robert W. Baseler (right), Manager of CAD Services.

## Electric Boat Holds Career Exposition For Area Students

Students from schools in southeastern Connecticut were invited recently to the second career exposition sponsored by Electric Boat. The Saturday morning exposition was intended to stimulate interest in the division among students soon to be graduated, as well as familiarize them with the varied job opportunities at the Groton shipyard.

Students were given a short presentation, which included welcome remarks by Audrey L. Scott, Supervisor in Shipyard Clerical Placement, and a discussion by Thomas E. Kelly, Manager of Hourly Employee Relations, on the division's need for skilled labor and the employee benefit advantages new hires can expect. Kenneth D. Brown, Director of Operations-Construction, and John J. Crowley III, Chief of Apprentice and Trade Training, also spoke.

A portion of the conference area featured trade displays, and throughout the morning representatives were available to talk with students about trades featured. Students were also taken on extensive tours of the shipyard, including stops at numerous trade locations where representatives gave brief orientations and answered questions. A luncheon was also served.

As with the first exposition held last fall, the event drew individuals from trade schools and local high schools.



The M26 Pershing, Called the Best U.S. Tank in World War II

## General Dynamics Flashback

### Pershing Was Best U.S. Tank in WWII By Dave Lange

The news was good indeed for American tankers whose thinly armored vehicles were easily knocked out by the superior tanks fielded by Germany in the last half of World War II.

In an incident in 1945, a Pershing — the newest tank to see action in Europe with the U.S. Army — survived 13 direct hits by a German 75mm tank at 1,200 yards. Any other U.S. tank would have been destroyed.

Finally, after being outgunned and underarmored for over two years, U.S. armored divisions had a tank that could outfight Germany's best, courtesy of Chrysler's Detroit Army Tank Plant (DATP), which later became part of the General Dynamics Land Systems Division.

The Pershing, named for the commander of the American Expeditionary Force in World War I, was the U.S.'s answer to Germany's Panther, Tiger and King Tiger tanks. Panthers and Tigers mounted more powerful guns and thicker armor than the Sherman, the most widely used Allied tank of the war. "By December 1944, the Sherman would have to have been considered almost obsolescent," a historian has recently written. Because it had a tendency to catch fire when hit by a round from a Panther or Tiger, the Sherman was dubbed "the Ronson" (a brand of cigarette lighter) by some crewman.

The Pershing, which historians have called the best U.S. tank of World War II, changed all that. The M26, the first version of the Pershing, was a 46-ton tank that carried a 90mm gun, which was bigger than the Panther's 75mm and the Tiger's dreaded 88mm. Just as important, the Pershing had thicker armor — on some parts of the tank, as much as 40mm more — than the Sherman.

The Pershing's only drawback was that it arrived at the front too late to be a war-winning weapon. Production did not begin until November 1944 and the Pershing was certified as battleworthy only four months before the Germans surrendered in May 1945. By the time Pershings went in service, Allied forces had already driven into Germany and the German army verged on collapse.

Only 200 of the eventual 2,420 Pershings produced at DATP and Fisher Body's Grand Banc Tank Arsenal came off the line before Germany surrendered. Fewer still reached the front. Those that did served with distinction with the 3rd and 9th Armored Divisions of the U.S. First Army. Pershings participated in such important campaigns as the 9th Armored's capture of the Ludendorff Bridge over the Rhine River at Remagen, Germany. The seizure of the intact bridge — all others along the Rhine had been destroyed by the retreating Germans — enabled Allied forces to make their first crossing of the Rhine and negate the river's importance as Germany's last defensive barrier against the Western Allies.

Five men manned the Pershing. The driver and the bow machine gunner sat side-by-side in the front of the hull. The commander, gunner and loader worked in the turret. Besides the 90mm cannon, the Pershing mounted a machine gun in the hull and another beside the cannon. A 12-cylinder engine could drive the M26 at a top speed of 20 mph. The tank had a range of 75 miles.

Although the war ended before the Pershing could be a decisive weapon, it influenced later models that are still in use.

In the late 1940s, designers re-engined, regunned and redesignated the Pershing the M46. When the Korean War began in 1950 with a new medium tank not ready for production, the turret of the new tank was mated with an M46 chassis, resulting in the M46A1.

A later version, the M47, went into production at DATP. By November 1953 DATP had made 3,440 M47s and the American Locomotive Company had built over 5,000 M47s. The M47 did not see combat in Korea and was quickly replaced in U.S. Forces by another Chrysler/DATP tank, the M48.

However, the M47 became an important export tank after ending its U.S. career. Other countries continually improved their M47s to keep pace with more modern tanks. Some M47s were refitted with components from M48 and M60 tanks, and still others received larger guns. South Korea converted a number of M47s into armored recovery vehicles. M47s are still in service in Greece, Iran, Italy, Pakistan, Somalia, South Korea, Spain, Turkey and Yugoslavia.



**Training Session for Ombudsmen.** Personnel ombudsmen from company divisions, facilities and locations in the eastern half of the U.S. attended an annual training session at the Corporate Office June 1st. The one-day session was conducted by Robert L. Abernathy, Corporate Director-EEO/Ombuds Program (center, background). Abernathy said the objectives of the meeting were the sharing of lessons learned in the past year, the improvement in resolving employees' concerns and the stressing of the fact that "People are our most important asset." Abernathy held a similar session for ombudsmen in the western half of the U.S. in San Diego May 25th.



## Consortium Selected To Develop Projectile For NATO Artillery

A consortium led by Valley Systems Division has been selected by the North Atlantic Treaty Organization (NATO) Source Selection Authority as one of two groups to receive an expanded feasibility contract to develop an artillery round called an Autonomous Precision Guided Munition.

The consortium's candidate is the All-Weather Smart Projectile (ASP), and Valley Systems is responsible for providing engineering and seeker development.

Other members of the Valley Systems-led consortium are Aselsan (Turkey), power supply development; Computing Devices Company (Canada), signal processor development; Dornier GmbH (Federal Republic of Germany), signal processor and warhead development; ENSAB (Spain), warhead performance and integrated logistics support; MATRA (France), guidance and control and simulation; OTO Melara (Italy), airframe and gun-hardening tasks; and Signaal (the Netherlands), transceiver design and development.

The consortium's 32-month, \$82 million contract from the U.S. Army Research and Development Command (ARDEC) is for the development of an all-weather, artillery-fired projectile designed to defeat future threats to NATO forces, according to Dr. James W. Berkovec, Valley Systems Division Director-ASP, who heads the division team.

The contract is expected to be signed in late July or August by a new company to be known as ASP Joint Venture. This company will issue subcontracts to the participating companies, including Valley Systems.



**Guests Given Tour.** Officials from the Navy League of the United States recently paid a visit to Electric Boat, which included a tour of the Groton shipyard. Shown above are (from left to right) William E. Weisert, Navy League Empire Region President; Rear Admiral John S. Claman, Supervisor of Shipbuilding in Groton; and Jack H. Morse, Navy League National President.

## VICA Competitions Judged by Employees From Land Systems

Six Land Systems employees recently judged various categories of regional student competition for the Vocational Industrial Clubs of America (VICA) in the Detroit area.

The Land Systems employees judged the categories of job skills, interviewing techniques, opening and closing ceremonies and extemporaneous speaking. Students competed in eight leadership categories and 43 skill areas.

"The competition was a wonderful opportunity for us to work with young people and to represent, by example, management in today's working world," said Ronald Kozlowski, a chief in Production Control, who coordinated Land Systems' participation in the VICA competition.

Other Land Systems employees who took part were: Bert W. Farmilo, Quality Compliance; Mitchell K. Johnson, Production Control; Ali M. Katirai, Industrial Engineering; Jonathan C. Nold, Program Management; and Roger M. Watkins, Systems and Procedures.

VICA services trade, industrial, technical and health occupation students. It offers leadership, citizenship and character-development programs and activities that complement the skills training needed by young adults.

More than 500 students competed in the VICA contest held at the south campus of Macomb Community College.

## Employees in San Diego Aid Disabled Students By Teaching Them Computer Courses

By Julie C. Andrews

Some San Diego employees are showing disabled students that there are no barriers to careers in private industry if they have the right preparation. The employees are serving as mentors in a special program that teaches the disabled students computer skills.

Two programs are offered through Grossmont College in the San Diego area: Business PC (Personal Computer) Specialist and Computer Programming. Denis L. Baldwin, Chief of GD Infonet at Data Systems Division-Western Center, is one of the mentors and serves on the Business Advisory Council (BAC) for the Business PC program along with Yvonne J. Decker, Infonet Project Manager. Curtis Garvin, John Withers, Michael Beebe and Joann Berger serve on the Computer Programming BAC.

"The BAC is involved at each step of the program," Baldwin said. "We help in selecting the students, and we evaluate the students three times during the program. We advise the college on what we think should be offered in the classroom from the point of view of the prospective employer. We also provide a mentor from the actual working world for each student."

Jordan Briley, Carl Faaland, David Kiley, Katherine Irelan and Jon Trumper of DSD-WC and Donna Finch from Convair serve as mentors. Mentors and students have a business and professional relationship, but a personal relationship develops, too.

"Our students are highly motivated, bright people who may have experienced continual frustration or failure," said Scott Barr, Grossmont College Project Director. "The mentors have helped students stay with the program who might have dropped out because of problems they encountered."

At the end of the classroom portion, students spend a four-week internship at a local company.

"The program is open to full-time students who are treated as actual trainees on the job," Barr said. "They dress professionally, and the students, instructors and mentors use business titles during class. At the end of the



**Specialized Instruction.** Mentor David Kiley demonstrates microcomputer software used in DSD-Western Center's Business Systems Development department to Grossmont College student Diane Egan.

program, we intend to turn out professional people ready to go to work."

To give the students a chance to meet with their mentors in their working environment, Baldwin arranged to have the class come to DSD-Western Center for a recent tour of the facility and the computer center.

This summer DSD-Western Center will have an intern from the program, and the company will host the graduation ceremony for the 25-member class at the Convair recreation park in July.

## Effective Communication Course Being Taught At Electric Boat's Engineering Dept.

By Graham Gavert

In Electric Boat's Engineering organization, communication is valued just as highly as technical expertise. For this reason, Engineering personnel are being taught how to put together an effective presentation.

"The course started as a way to improve our design reviews to the government," said Carl O. Larson, Director of Nuclear Engineering. "We felt that better communication skills were needed by our people, as well as a more coordinated approach to design reviews."

The project was developed by Carol L. Berge, Administrator of the Engineering Quality Improvement Program, who had experience in the division's Education Department. She developed a course that is not a mathematical formula into which people merely insert data and come out with an effective presentation, she said. Rather, she offers a format for her audience to use as it applies to individual circumstances.

Since the course is designed for a technical audience, examples are taken from the world of engineering. A

handbook that contains all the information that was discussed in the oral course is given to participants for their future reference.

Besides offering ways to plan a presentation, Berge also discusses techniques involved in delivering one and discusses small details that contribute significantly to the overall success of a presentation.

"I ask the audience at the beginning to watch some of the things I do while I'm going through the more structured part of the course," Berge said, "so we can talk about them afterward."

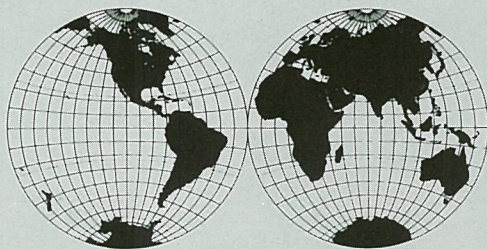
"A presentation really doesn't provide you with much time to get your message across," she said. "Therefore, anything you can do to keep your audience focused is going to be beneficial."

Since the start of the effective presentation program, more than 1,000 Engineering employees have been through the course. In addition, Berge has given the course to about 500 people at several universities in Florida.



**Carol L. Berge Discusses Communication with Engineering Personnel**





## Around the World

**CHQ:** John D. Shilling joined as Director of Programs-UWC... Michael P. Tilly as Senior Engineer-Systems Analysis (UWC)... Thomas A. Gregg transferred from Convair and was promoted to Corporate Dayton Representative... Bruce L. Dirks was promoted to Corporate Manager Equity Portfolio.

**Fort Worth:** Billy F. Hendrix was appointed to Financial Management Director... Charles E. Adams was promoted to Quality Assurance Manager... Daniel C. Anderson Jr., Milo R. Anderson, Frederick W. Auld, Michael E. Batchelder, Robert A. Carlson, Donald R. Fleming, Joseph H. Frey Jr., Joe L. Hart, J.T. Molder, John M. Rhodes, Philip P. Truax, Bobby M. Wells and Samuel M. White Jr. to Engineering Project Manager... Bruce E. Bartlett to Senior Field Service Engineer... Bedford E. Beaty to Manufacturing Engineering Manager... William F. Black, Robert G. Dunn, Don E. Duttweiler, Lewis L. Fletcher, Mike Gordo Jr., Jeffrey K. Gossett, Robert S. Herb, Marty D. Holland, Carl B. Huncharek, John D. Korstian, Melvin G. Laman, Melton L. Luttrell, Roger F. Marquardt, George F. Mason Jr., David P. McKenzie, Larry J. Mestad, Francis O. Olson, Michael J. Patterson, Roger L. Ratzlaff, Billy R. Reardon, David L. Revels, Joe L. Snead Jr., James W. Sneed, Robert L. Speer Jr., Robert R. Stockton, Mary S. Thiessen, Joseph J. Walker Jr. and Francis D. Webb Jr. to Engineering Chief... Randall M. Bolding, John H. Chaffin, Billy J. Howard, Thomas D. Kennedy, Weldon M. Walker and Tommie C. Webster to Project Engineer... Gwendolyn D. Boyd to Information Systems Manager... Alan R. Buchrucker, Maynard N. Heth and Steven M. Martin to Property Management Manager... Michael B. Busby and Mark D. Peden to Project Manager... Arthur P. Carter Jr. to Security Supervisor... Jane E. Christensen to Security Analyst... David G. Cox and Sandra K. Kenerley to Security Services Supervisor... Charles M. Cremer to Senior Tool Engineer... Robert E. Davis to Logistics Group Engineer... Michael L. Dollahite to Senior Program Analyst... Pamela R. Fiederlein, Patrick D. Ricks, William L. Seay and David G. Shirley to Material Program Administrator... Sue G. Gobel and Scott S. Vrablik to Senior Planning Analyst... Leonard D. Gregory to Administrative Services Specialist... William A. Haines to Procurement Manager... Mary C. Harper to Senior Quality Assurance Engineer... Kenneth V. Herring to Material Planning Supervisor... Donald J. Hilvers, Vaughn T. Matney and Richard J. McClellan to Purchasing Agent... Ronnie R. Horn to Production Management Specialist... Charles R. Hyatt to Senior Manufacturing Engineering Specialist... Wayne H. Killough Jr. to Engineering Administrative Group Supervisor... Matt D. Latham to Security Services Chief... Courtney A. Lee to Administrative Services Representative... Lowell L. Lehner, Ronald W. Morton and Gary L. Webster to Manufacturing Control Supervisor... James W. Manley and Henry W. Nickell to Assistant Project Engineer... Ricky W. McDaniel to Contracts Administrator... James A. Munger and William G. Pooler to Inspection Supervisor... Donald B. Norman to Schedules Specialist... Janet K. Novey and Steve Weems to Administrative Assistant... Dennis Polley to Property Management Specialist... John P. Reilly to Logistics Supervisor... Harold W. Sanders Jr. to Engineering Project Manager... Kevin Q. Shaver to Manufacturing Control General Supervisor... Michael A. Smith to Senior Quality Control Field Engineer... Ricky W. Snow to Engineering Administrative Supervisor... Charles E. Stein III to Project Factory Specialist... Michael S. Terry to Information Systems Specialist... Dewey R. Tipton to Electronic Products Program Manager... Steve P. Wheeler Jr. to DoD Security Chief.

**Convair:** Ralph E. Allen was promoted to Division Planning Manager... James M. Parrotte to Technical Publications Manager... Gary J. Tragger to Engineering Manager... Robert D. Hansen to Manufacturing Operations General Supervisor... Douglas A. Stephens to Logistics General Supervisor... Robert L. Collis to Tooling Supervisor... Troy E. Devin and Marcia A. Sutherland to Manufacturing Control Operations Supervisor... Harvey R. Jones Jr. and Alexander D. Rinaldi Jr. to Plant Services Operations Supervisor... John C. Matson and Robert M. Polo to Group Engineer... Raymond H. Casarrubias to Plant Protection Lieutenant... John J. Swatling to Human Resources Supervisor.

**Space Systems:** James E. Holloper, John E. Niesley and Burton G. Sherwood were promoted to Program Manager... Jack R. Wellington to Finance Manager... Pete C. Morris to Manufacturing Operations General Supervisor... Frank J. Giuseppini Jr. to Industrial Engineering Operations Supervisor... Ken J. Miller Jr. to Industrial Engineering Chief... Robert R. Reid to Engineering Specialist... Eugene E. Perkins to Engineering Chief... Thaddeus S. Sitek to Senior Project Engineer... Robert R. Frederick to Quality Assurance Chief... Ray R. Brown to Quality Control Chief... Robert B. Petersen to Quality Assurance Group Engineer... Tom E. DeShon and Sheryl J. Squire to Material Operations Supervisor.

**Electronics:** Rupert F. Church was promoted to Program Manager... Sandra K. Kaufman to Material Specialist... Amy B. Loeffler, Albert C. Pleskus, Kenneth R. Michna to Engineering Section Head... Gary A. Lotze and Donald George to Human Resources Analyst... Sharon L. John and James R. St. John to Operations Section Head... Allan R. Walker to Chief Project Engineer... Bryan F. O'Leary and Michael McKnerney to Senior Engineer.

**Electric Boat:** William P. Dupuis and William W. Trott were promoted to Engineering Manager... Richard H. Oeschger to Reactor Services Manager... Robert Campbell to Quality Chief... Harry E. Moore to Ship Superintendent... Carl Fast and Leon C. Knudsen to Engineering Supervisor... George R. Martin, Sharon D. Maturana, Mark A. Mills, Jonathan E. Potter and Christopher G. Stewart to Foreman... David A. Carter, James B. Monroe and Samuel E. Parker to Senior Test Operating Engineer... Leroy P. Vanwhy to Test Operating Engineer... At Kesselring, Michael E. Law to Test Supervisor... At Charleston, Loyal L. Bradshaw to Foreman... At Quonset Point, Kenneth Brindamour and Austin Payne to Production Methods Engineering Supervisor.

**Land Systems:** Patricia M. Potter was promoted to EM/OS Network Administrator... Celeste A. Radi to Senior Financial Analyst... Michael A. Puzouli to Quality Programs Manager... J. Lee Sherman and Richard K. Kreitz to Manufacturing Engineering Manager... Chaman L. Bhan to Engineering Supervisor.

**Valley Systems:** Morris C. Clark was appointed to Chief Engineering and Technical Director... Robert W. Sweginnis and Dennis M. Rees were promoted to Section Head... William R. Burk and Paul G. Redman to Group Engineer... Paul W. Comings to Program Administration Manager.

**Pomona:** Gregory S. Shelton was appointed to Design Engineering Director... Robert M. Abbott was promoted to Design Specialist... Steven A. Denning to Proposal Development Manager... Robert R. Estrada to Senior Facilities Specialist... David L. Leslie to Project Engineer... John F. McElwee Jr. to Manager IRAD and New Business Funds... William E. Pederson to Programmer Analyst Associate.

**GDSC:** James L. Greenberg was appointed M-60 Conversion Program Director... Christopher K. Hansen to Peace Vector Administration and Support Deputy Director... Sheryl J. Wragg was promoted to Egyptian Tank Plant Program Contracts Manager... Donnie E. Brown to Training Supervisor... Frank B. McKenzie to Program Manager... Richard M. Hunter to Logistics Support Manager... Lloyd R. Nye to Manufacturing Manager... Richard J. Lee to Operations Administration Manager... Thomas P. Riley to Proposal Development Manager... Billy E. Ashcraft to Production Control Supervisor... Jerry L. Saldivar to Material Control Supervisor... Donald W. Minton to Logistics Group Leader... Robin E. Reed to CSSR Labor Specialist... Janet L. Kohler to Human Resources Representative... Gerald L. Hone to Buyer... Sheldon D. Ledbetter to Computer Systems Specialist... Edwin L. Fritz to Senior Aircraft Specialist... Richard F. Gibb transferred from Space Systems and was promoted to Program Manager... Michael R. Douthit transferred from Space Systems and was promoted to Tooling Supervisor.

**Cessna:** Don W. Smith to Quality Manager... Mark Paolucci to Special Missions & Government Sales Manager... George W. Rosendale to Material & Administration Manager... Lynn E. Oelkers to Inspection General Supervisor.

**Data Systems:** At Western Center, Bill A. Maddox was appointed to Product Software Director... Janet Stormoen transferred from home office and was promoted to Finance Manager... At Central Center, John D. McMahan was promoted to Business Systems Development Chief... Wayne L. Wright Jr. to Engineering Software Chief... Robert B. Gardner to Operation Services Manager... Daniel Montgomery to Tech Services Manager.

## Computers Replacing Instruction Sheets At Plant Workstations

Workstations that furnish computerized instructions to production assemblers are being installed at the Land Systems Sterling Plant.

The Computer-Distributed Instructions (CDI), delivered to each operator on demand, replace operation sheets that detail the assembly of electrical components and boxes for the Abrams tank. The system gives each operator immediate access to most recent revisions of the assembly procedures and saves distribution, handling and filing of the paper system it replaces.

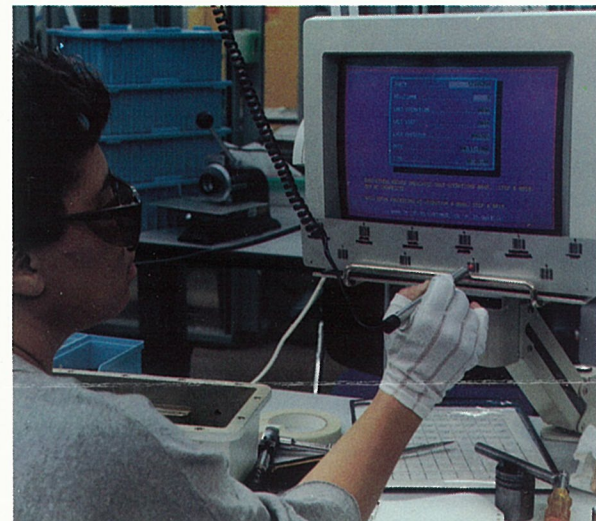
All of the 200 computerized workstations, to be installed as part of the Sterling Plant modernization program, will be in use by the end of summer.

Daniel L. Sexton, Engineering Supervisor in Manufacturing Development and Support, said the CDI system is an important part of the plant's computer-integrated manufacturing plan with "some interesting options to other Land Systems plants."

Operators feed back to the system the status of every assembly and subassembly through a serialization plan directly traceable to originating contracts and delivery orders.

The system can also help other aspects of the manufacturing effort. For example, charting for statistical process control is made easier through information from the system. The system also can generate special reports.

Sterling has developed still other systems to control activities ranging from building kits to material releases.



**Computerized Workstation.** Cecelia J. Franklin, an assembler at the Land Systems Sterling Plant, calls up instructions on her screen to build a battery box assembly for the Electronic Control Unit of an Abrams tank.

## Martha Ward Wins Radio Station Contest As Best Secretary

Martha Ward, a secretary at Electric Boat, recently won a contest held by a local radio station for best secretary in the area.

Ward was nominated by Robert C. Smith, Senior Educational Services Instructor, who said that Ward serves as the division's Bloodmobile Coordinator in addition to her duties as a secretary. She arranges all the blood drives throughout the year and handles all associated paperwork and publicity.

Smith praised her team spirit, positive attitude and cheerfulness.

The contest was sponsored by station WVVE in Mystic, Conn. As her prize, the station drove Ward and her husband, Ray, in a chauffeured limousine to a "luxury lunch" at a well-known local restaurant.

## Engineer Is Honored

Joe D. Kutschka, an engineering staff specialist, has been named Valley Systems Division's first Engineer of the Year for making outstanding technical contributions and for innovative problem solving during 1987.

He earned the recognition for his engineering expertise, respected leadership and innovative creativity. All of these qualities contributed to the division's successes in the Rolling Airframe Missile program, Stinger Reprogrammable Microprocessor program, fabric wing independent research and development and Two-Color Infrared Seeker.





Peace Corps Volunteers James and Anita Pauwels Pose on a Hillside Overlooking Fish Ponds in Burundi While Farmers Fish from a Pond Started by the Couple

# Service in Peace Corps in Africa Taught Pauwelses Richness of Life

By Joe Stout

During two years of service with the Peace Corps in Burundi, Africa, Fort Worth engineer James E. Pauwels and his wife, Anita, learned that even the poorest people in the world can be rich.

The company granted Pauwels a leave of absence to be a Peace Corps volunteer from mid-1985 through 1987. The couple sold their home and automobiles and went to Norman, Okla., to learn about raising fish.

They were then sent to Burundi for five months of intense training in French, the country's official language, and Kirundi, the language most commonly used there.

After the training, it took another six months to set up a fishery program and begin to gain acceptance by the farmers they were trying to help.

"We went to learn about people, learn a language and spend some time together," Pauwels said. "We achieved much more than we'd hoped, in all three areas."

"A farmer once asked me if everybody in America is wealthy, and of course I told him no. I didn't know what to answer, though, when he asked me, 'Is it true that everyone there wears shoes?'"

"Before we left, we learned that many people in Burundi are indeed rich, in their own way. They have good, loving families and they have lots of fun. This is something you

can find out without the benefit of language," Pauwels said.

The couple were expected to start 20 fish ponds each during their stay in the Central African nation, but instead they started more than 190, with a total area of 14 acres and an annual production capacity of 15 tons of fish.

Anita Pauwels was named the Outstanding Volunteer of the Year for Africa and received the Peace Corps' John F. Kennedy Award in a ceremony at the White House. The Pauwelses are featured in a television commercial about volunteer opportunities in the Peace Corps.

Life in Burundi required quite a few adjustments, Pauwels said. The couple were provided comfortable housing, but motorcycles were their only means of transportation. They grew a variety of vegetables in a garden outside their house, but most American-style products were unavailable. A few things, such as intestinal parasites, simply had to be tolerated, he said.

The two worked individually, riding their motorcycles to the area's "farms" — small tracts of parceled-out government land — and teaching families how to build fish ponds. The 30-foot by 90-foot ponds were constructed manually, and an initial stock of 300 fingerlings was sold to the farmers for a nominal fee.

The Peace Corps volunteers also taught the farmers to establish a biological system in the ponds by fertilizing them with compost. "The first few times we suggested this, the people acted like we were crazy," Pauwels said. "Eventually, word got around that we knew what we were doing, and there was a lot of demand for our help."

When the perchlike fish grow large enough for use as food, the ponds are drained for harvesting and the fish are sold at market, Pauwels said. The product of one pond can provide a significant supplement to a farmer's income, which averages about \$200 a year in Burundi, he said.

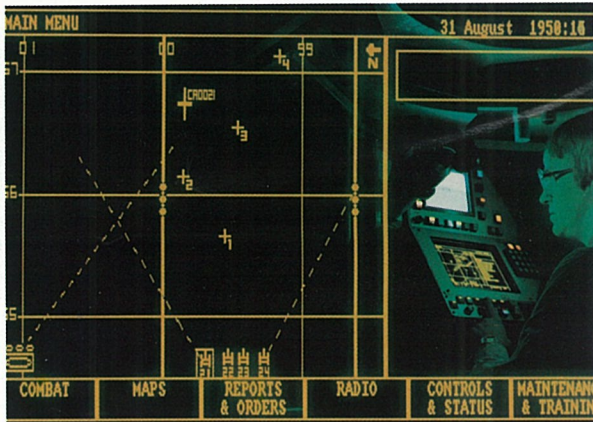
Peace Corps service is not exactly new for Jim Pauwels. In fact, he learned about General Dynamics when he was given a list of potential employers upon completing a Peace Corps assignment in India in 1967. Anita Pauwels, who works as an artist, had never been in the Peace Corps but had done volunteer English teaching to Vietnamese boat people while living in south Texas. Pauwels said his Peace Corps experience has taught him that people throughout the world are basically the same, regardless of their nationalities or circumstances. "We laugh, we cry and we all want the best for our families," he said. "When everybody learns that, we'll have a much better world to live in."

## Questionnaire

We'd like to make *General Dynamics World* as good a company newspaper as it can possibly be. But we need your help. We want to find out what you like or dislike about it. So please take a few minutes (employees only) to give us your answers to the following questions. Then return it to us (signature optional). Remember, it's your newspaper.

- Overall, *General Dynamics World* is (check one):  
☐ Very good; ☐ Good; ☐ Fair; ☐ Poor; ☐ Very poor
- Do you think it serves the company and its employees the way it should? ☐ Yes; ☐ No  
Any comments? \_\_\_\_\_
- Are you satisfied with the way it is distributed to you? ☐ Yes; ☐ No  
Division or facility: \_\_\_\_\_ Any comments? \_\_\_\_\_
- Is the content what it should be? ☐ Yes; ☐ No  
Are the stories interesting and informative? ☐ Yes; ☐ No  
Are they well written? ☐ Yes; ☐ No  
Are the photos interesting? ☐ Yes; ☐ No  
Any comments? \_\_\_\_\_
- Would you like to see anything changed? \_\_\_\_\_
- Would you like to see anything added or deleted? \_\_\_\_\_
- What do you like most? \_\_\_\_\_  
Least? \_\_\_\_\_
- Do you agree that there is a need for a corporatewide publication such as *General Dynamics World*?  
☐ Yes; ☐ No
- Any overall comments? \_\_\_\_\_

Please send your completed questionnaire in company interoffice mail to: Public Affairs Department, Corporate Office. (Results of this survey will be published in a future issue.)



**Electronic Battlefield Management Concept Tested.**  
Rosalind L. Spina, Supervisor of Operation Support in Simulation, uses an Inter Vehicle Information System (IVIS) panel to plot target strategies. When installed, the IVIS will allow tank commanders to transmit sensitive battlefield information over the standard military FM radio, using a touch sensitive display rather than voice. Land Systems is developing the IVIS for the U.S. Army as part of a program to improve the capabilities of the M1A1 Abrams main battle tank. The IVIS could be installed in production tanks as early as 1992.

## Our Commitment To Society

- We will act as responsible and responsive corporate citizens and in a moral, ethical and beneficial manner.

(From the General Dynamics Standards of Business Ethics and Conduct.)



GENERAL DYNAMICS

# World

Volume 18 Number 7

July 1988

## Agreement Is Signed By Four Countries On Agile Falcon

The United States, Norway, the Netherlands and Denmark recently signed a memorandum of understanding (MOU) that paves the way for European participation in codevelopment of the Agile Falcon F-16 derivative.

Belgium has agreed to the MOU in principle and is expected to sign in the near future.

The agreement establishes terms that will allow European industries to take part in the design and development of a new aircraft configuration incorporating the latest aerodynamic, materials and electronics technologies. The Agile Falcon concept is keyed to the air combat threat expected in the late 1990s.

The U.S. Air Force has already expressed strong interest in the Agile Falcon.

General Dynamics proposed the Agile Falcon program last July as the next logical step in the evolution of the F-16.

### Company Ad on Page 8

Another in a series of advertisements the company is running in major newspapers and national magazines is displayed on Page 8 of this issue.

## San Juan Delivered; To Be Commissioned By Navy on Aug. 6th

The SSN 688 fast-attack submarine *San Juan* (SSN 751) was delivered to the U.S. Navy June 30th.

The 360-foot, 6,900-ton submarine is the 23rd *Los Angeles*-class ship built by Electric Boat in Groton, Conn. It is the first submarine to feature several improvements, including the new BSY-1 combat system, retractable bow planes and a hardened sail to allow the ship to break through ice when surfacing. *San Juan* was delivered within contract schedule.

*San Juan* will join the fleet during commissioning ceremonies on Aug. 6th at the U.S. Naval Submarine base in Groton.

Electric Boat has eight other fast-attack submarines under construction as well as seven *Ohio*-class Trident missile-firing submarines.

## Israel Orders More F-16C/D Aircraft

The government of Israel recently signed a Letter of Agreement for the purchase of 60 more F-16C/D aircraft with an option to add another 15.

This is Israel's third F-16 order. Fort Worth delivered 75 F-16A/Bs to the country originally and will complete deliveries under Israel's first follow-on order, for 75 F-16C/D airplanes, this year.

The first delivery is scheduled for mid-1991.

## Company Ads Shown on TV

The company's advertising campaign has moved to network television.

Commercials are being shown on two ABC-TV programs, "This Week with David Brinkley" and "Business World." Both are carried on Sunday mornings.

Company commercials will air on the Brinkley program each week through Oct 2nd and on "Business World" on July 31st, Aug. 7th, Aug. 14th, Aug. 28th and Sept. 11th.



**Last Delta Darts Retired.** An F-106 of the New Jersey Air National Guard flies over Atlantic City with one of the F-16s that are replacing Delta Darts in air defense service with the 177th Fighter Interceptor Group. The last F-106s will be modified for use as target drones.

## Last F-106s Are Retired from Active Service As New Jersey ANG Switches to F-16s

By Joe Stout

The last squadron of Convair-built F-106 Delta Darts was retired from active service recently to make room for F-16 Fighting Falcons with the New Jersey Air National Guard's 177th Fighter Interceptor Group.

The unit marked the occasion with a combination "Dart-Out" and F-16 activation ceremony at its base at the Atlantic City FAA Technical Center and International Airport. The F-106 didn't go "quietly," considering that a highlight of the event was a sequence of fly-bys featuring up to 12 Delta Darts in display formation.

An F-16 joined the formation on some of the passes, and a U.S. Air Force demonstration pilot from Shaw AFB, S.C., performed a high-performance F-16 air show.

Keynote remarks by Maj. Gen. Francis R. Gerard, Adjutant General of the New Jersey ANG, centered on the Delta Dart's 29-year history of front-line service in defending the aerial boundaries of the continental United States.

The F-106 was the last U.S. aircraft designed specifically for the air defense role. As the replacement for the Convair-built F-102 Delta Dagger, the F-106 incorporated a number of features, advanced for the aircraft's time, that earned it the reputation of being the "ultimate" air defense

fighter, General Gerard said.

The Fort Worth-built F-16 has been selected as the Air National Guard's air defense fighter for the future and will fill 10 squadrons. The 177th FIG is the fourth F-16 unit activated for U.S. air defense, joining others in Florida, Vermont and Montana.

Former astronaut Gordon Cooper, one of the Air Force's original F-106 test pilots, spoke at a banquet held in conjunction with the Dart-Out. Maj. Gen. Jimmie V. Adams, Commander of the 1st Air Force, was also in attendance.

The F-106 made its first flight in 1956 and entered active service in 1959. In 1958 it established the world speed record for a single-engine airplane at Mach 2.35. The record has never been broken.

Several of the 177th FIG's F-106s were flown back to the San Diego area for a few days in May when they participated in fly-bys at the Air/Space America 88 air show.

The last Delta Darts will join others that have been retired in recent years in being modified for service as unmanned drones. They will be used as remotely controlled targets in missile development and testing.

## Two Employees Win a Ride in an M1A1 Tank

Two lucky Electronics Division employees, Connie R. Raleigh and Nancy S. Pauley, went for a ride in an M1A1 Abrams tank recently. They won a trip to Land Systems' Detroit Arsenal Tank Plant in a drawing sponsored by Electronics to celebrate completing the 75,000th circuit card for the M1A1 program.

The drawing rules provided that one hourly and one salaried employee would win a trip to Michigan and a ride in the tank they helped build. Pauley works in the Electronics Accounting department and Raleigh is a dispatcher. They were accompanied during their spin around the test track by Robert Klann, Electronics' Circuit Card Program Manager.

"The tank ride was fun," Pauley said. "There was no bouncing around — just a very smooth ride."

Raleigh said, "I can't believe how smooth the tank rides, even at turns going 45 mph."

Klann said he was amazed at the amount of power the vehicle demonstrated.

The group from Electronics also toured the Detroit plant and the Troy Technology Center.

Printed circuit cards produced by Electronics Division are used by the Sterling Plant in the assembly of electronic equipment, such as hull networks boxes. They are also used in Land Systems' research and development projects.



Nancy S. Pauley (left) and Connie R. Raleigh Taking a Spin in a Tank



# Current & Comment

(Observations on news of interest to the company and the industry will appear regularly in this column.)

## “Operation Ill Wind” Blows Little Good . . .

The mid-June “Operation Ill Wind” seizure of defense contract-related documents in 12 states nationwide — and subsequent day-to-day developments — have once again provoked considerable public and taxpayer mistrust of the entire industry.

Regrettably, all of this arrives at a time when private contractor initiatives to cut waste, to strike tighter business standards and to hone policies and procedures had just begun to catch the public eye.

What are the facts? The view from the sidelines remains murky. As General Dynamics Chairman Stanley C. Pace observed in recent press interviews and public statements, “We just don’t know what’s out there, generally or specifically. We need to keep in focus that the present public information about the investigation is preliminary and could be misleading.”

In the meantime, this company and others in the industry — whether or not publicly linked to the probe — can only continue to fully support their respective in-place internal programs that regulate ethical business behavior.

Pace urged all employees to do just that in his recent companywide letter on the subject. He also noted that, while it was disappointing that the industry’s reputation was again “adversely affected,” our company has not been involved and GD employees had done “an exceptional job under our strengthened self-governance program.”

In a July 11th letter to congressmen and Defense Department officials, Pace stated his support of a “comprehensive and effective investigation of any suspected wrongdoing in defense procurement.” Enclosed with the letter was a statement, released earlier that day to the media, in which General Dynamics “declared unequivocally” that it had made no payments to former Navy Assistant Secretary Melvyn Paisley and that “categorically denied” any improprieties relating to the Advanced Tactical Aircraft Program.

In interviews with *Business Week*, *Defense News* and others, Pace noted: “We have tried to set a tone, to establish explicit rules for the game, if you will, and to sensitize our people all the way up and down the line to follow those rules. In a way, this could be looked upon as a test as to whether or not we did get our instructions across.”

The bottom line is that, to date, our company is not one of those that has been targeted in this wide-ranging investigation. We are all hopeful that this remains the case and, as Prudential-Bache analysts Paul Nisbet and Keith Patriquin said in their latest Aerospace/Defense Industry Update: “It just might be that the internal ethics training efforts at General Dynamics these past few years have paid off.”

## Congressional Report Cites Quality Control

A Congressional task force on high technology and competitiveness has praised Fort Worth’s F-16 quality control.

“Through General Dynamics’ quality program, Air Force jets have become increasingly flight ready,” the report from the House Republican Research Committee (HRRC) states.

The report, “Quality As a Means To Improving Our Nation’s Competitiveness,” compared the current 92 percent readiness rate of F-16Cs to the 78 percent readiness rate of older A-10As and 82 percent flight-ready rate of F-15Cs.

“This increase in operational readiness means we have 14 percent more aircraft available at any given time at no additional cost,” said the report.

The HRRC study, released in July, showcases American companies that have flourished by adopting quality principles and also discusses the cost to the nation of poor quality control. It was prepared by Brent Rosenkranz, Staff Director of the HRRC’s Task Force on High Technology and Competitiveness.

## Updated List of General Dynamics Personnel Ombudsmen

Division/Subsidiary	Location	Personnel Ombudsman	Hotline Number
Corporatewide	St. Louis	Robert L. Abernathy	800-322-9299
	Cessna Aircraft	Fred C. Bright	316-946-7360
	Convair	Joanne Kowalik	619-573-9528
	Corporate Office	Robert L. Abernathy	314-889-8480
Data Systems	Washington	R. Kent Nixon	703-553-1367
	St. Louis	(Not Assigned)	314-851-8925
	Fort Worth	Carol F. Pendley	817-737-1820
	Norwich	Harold H. Stoddard	203-823-2305
	Pomona	K. Wayne Davis	714-868-3120
	San Diego	Nan M. Boulais	619-576-5739
	Groton	Donna M. Simpson	203-441-1200
Electric Boat	Avenel, N.J.	Richard G. Heckman	201-636-3798
	Quonset Point	Timothy M. Crowley	401-268-2909
	San Diego	Michael M. Brown	619-573-5600
Electronics	Fort Worth	William G. Nutt	817-777-2656
	Abilene	Robert E. Brewer	915-691-2810
Freeman United	Chicago	James T. Ryan	312-443-6910
	St. Louis	Mary C. Linder	314-851-4046
	LS-C.O.C.	Donald W. Ishmael	313-583-5898
	Center Line	Diane R. Slis	313-497-7680
	DATP	Michael E. Fedorka	313-573-1113
	Lima	W. Edward Londo	419-226-4407
	Scranton	Calvin B. Smith	717-876-2469
Material Service	Chicago	Edward K. Wilverding	312-372-3600
	Pomona	LaVerne D. West	714-868-1010
	Camden	Ronald K. Hill	501-574-4468
Space Systems	Navajo	(Not Assigned)	602-729-6557
	San Diego	Roberta C. Baade	619-547-8990
	Cocoa Beach	Jimmie B. Fletcher	305-783-4812
	Vandenberg AFB	Norman D. Page	805-865-5330
Valley Systems	Rancho Cucamonga	H. Daniel Altmire	714-945-8094

## Employees Are Responding with Many Calls On Issues in Personnel Ombuds/Hotline Program

The company’s Personnel Ombuds/Hotline Program has been averaging between 500 and 600 calls a month since its implementation 15 months ago.

Robert L. Abernathy, Corporate Director-EEO/Ombuds Program, said that by the end of June company personnel ombudsmen had received 8,283 contacts. “At that time, fewer than 200 of the issues reported remained unresolved,” Abernathy said.

“The program was initiated in April 1987 to ensure that our employees had a full opportunity to receive a hearing for their complaints and concerns,” Abernathy said.

“The issues addressed most often in the contacts had to do with working conditions, interdepartmental transfers, harassment, benefits entitlement and interpersonal relationships,” Abernathy said. “About half of the contacts received, however, were by employees who were simply asking for information.”

Contacts may be made over hotlines that are in operation at 30 division and facility locations and through one

at the Corporate Office that handles matters corporate-wide, he said.

“It is desirable whenever possible to resolve such concerns through normal supervision,” Abernathy said, “but if an employee feels this is not possible, the Personnel Ombuds/Hotline Program offers a means for a fair, impartial and, if desired, a confidential hearing.”

Stanley C. Pace, Chairman and Chief Executive Officer, announced the establishment of the program in a memorandum to all employees on March 27, 1987.

“He guaranteed at that time that employees who used it would not be subject to retaliation and that employees’ confidentiality would be protected,” Abernathy said.

“The memorandum also promised swift action if an act of retaliation was directed at an employee,” Abernathy said.

Employees may use their local ombuds hotline or the toll-free corporate phone number.



**Balloon Campaign.** Jean Murphy, Data Systems Division-Western Center Security Analyst (far right), presents a check to Gage Elementary School in San Diego, Calif., on behalf of Convair, Space Systems, Electronics and DSD-WC to support the school’s “Say No To Drugs” campaign. Gage students launched more than 1,000 balloons containing personalized antidrug messages. Also at the event were San Diego Police Officer Sara Lara, Penny Penguin from Sea World Theme Park and Eva Lovasz, event coordinator.



# M.R. Barlow Wins Top Alumnus Award From Michigan State

Melville R. Barlow, Vice President and General Manager of Electronics Division, received the 1988 Claud R. Erickson Distinguished Alumnus Award during commencement ceremonies for Michigan State University's College of Engineering June 10th.

The award is given to an alumnus of the College of Engineering who is an outstanding leader in the profession of engineering and also contributes to the university.

Barlow is a charter member of the Industrial Advisory Committee of the Case Center for Computer-Aided Design and Engineering at the College of Engineering and has played an active role in helping the center acquire equipment. He chaired a successful endowment fund campaign for the center in that capacity.

Barlow is also an Associate Fellow of the American Institute of Aeronautics and Astronautics, a member of the Board of Directors of the Government Division of the Electronic Industries Association and a member of the Navy League, the Air Force Association and the Association of the United States Army.

# San Diego Chapters Of Management Group Award Scholarships

The San Diego division chapters of the National Management Association gave away record scholarship amounts this year to graduating high school seniors. The grand total awarded to sons and daughters of Convair, Space Systems and Electronics employees was \$38,500.

Throughout the year, the NMA chapters raise money for their scholarship funds through drawings at their monthly meetings. Convair NMA's scholarship fund also receives a grant from the Reuben H. Fleet Foundation. Fleet was the founder of Consolidated Aircraft Company, the parent of Convair Division.

This year Convair awarded 15 scholarships of \$1,500, Electronics gave \$600 to 10 graduates and Space Systems awarded \$1,000 scholarships to 10 graduates.

# Lima Tank Plant Employees Provide the Major Support For Area Special Olympics

The Area III Special Olympics held recently in Lima, Ohio, received the majority of its support from Land Systems employees of the Lima Army Tank Plant.

About 50 volunteers from the Land Systems Management Club and UAW Locals 2975 and 2147 joined 37 others from the Lima community to organize and run the 27-event competition for handicapped children. They set up the contests, helped with the opening ceremonies, timed and measured the events and helped with cleanup afterward.

Financial support for the event also came from the Management Club and the two unions, which provided \$3,600 for T-shirts, banners, flags, balloons, programs, facility use and equipment. The state of Ohio's contribution of \$1,200 and \$100 in personal donations made up the remainder of the financial support.

Savings and Stock Investment Plans			
Annual Rate of Return for the 12 Month Period Ending:			
	May 1986	May 1987	May 1988
<b>Salaried</b>			
Government Bonds	12.7%	6.9%	7.5%
Diversified Portfolio	38.8%	22.3%	(7.5)%
Fixed Income	12.2%	11.8%	11.0%
<b>Hourly</b>			
Government Bonds	12.1%	7.1%	7.7%
Diversified Portfolio	39.4%	23.5%	(7.7)%
Fixed Income	12.2%	11.8%	11.0%
GD Stock Closing Price	\$79.25	\$64.25	\$54.12
( ) Negative number			



General Dynamics Test Pilots Kevin Dwyer (left) and Bland Smith Will Fly the F-16C at the Farnborough International Show

# Two Fort Worth Test Pilots Are Busy Planning Updated Flight Routine for Farnborough Show

General Dynamics test pilots Kevin Dwyer and Bland Smith are planning something different when they fly an F-16C Fighting Falcon during daily aerial demonstrations at the Farnborough (England) International 88 air show Sept. 4th-11th.

Smith said a new flight routine will be introduced at Farnborough to update the routines flown at the 1987 Paris Air Show and Asian Aerospace 88 in Singapore. "The new routine will feature more vertical maneuvering," he said.

The demonstration will last about five minutes and will be flown once per day. Dwyer and Smith will alternate flights. They will pilot an F-16C leased from the U.S. Air Force's 86th Tactical Fighter Wing at Ramstein Air Base, West Germany.

Dwyer made his first international air show appearance at the Paris Air Show in 1985. He has flown in numerous other shows, including Paris in 1987 and Singapore in 1988. Farnborough will mark Smith's second international air show. He made his air show debut at Singapore in 1987.

"From a pilot's standpoint, air show flying is a fun thing to do," Smith said. "You fly a low-level profile in front of a lot of people, and you get the opportunity to demonstrate the airplane's capabilities. In our job we talk to a lot of people about the airplane, but we don't get many oppor-

tunities to actually demonstrate it."

A graduate of the U.S. Naval Academy and the U.S. Naval Test Pilot School, Dwyer joined General Dynamics in 1980 and serves as Chief Experimental Test Pilot. He is involved in the F-16 Night Attack Project and in future F-16 developments. Dwyer has accumulated more than 3,000 flight hours in various aircraft, including the F-8 Crusader, the F-14 Tomcat, the A-7 Corsair II and the F-16.

Smith, a graduate of Texas A&M University and the Air Force Test Pilot School, joined General Dynamics in 1985 as project pilot on the Advanced Fighter Technology Integration/F-16. He now serves as project pilot on the Air Defense Fighter and the National Aero-Space Plane. As an Air Force test pilot, he flew the F-4 Phantom II and the F-16 and was project pilot for Advanced Medium Range Air-to-Air Missile and Low Level Laser Guided Bomb tests. He has more than 2,800 flying hours.

Farnborough International and the Paris Air Show are Europe's premier aerospace events and attract exhibitors from around the world. At Farnborough, the Soviet Union is scheduled to display its MiG-29 Fulcrum fighter for the first time.

Farnborough is held semiannually in even-numbered years and the Paris Air Show is scheduled in odd-numbered years.

# Cherokee Firm Cited for 'Excellent Products'

Cherokee Nation Industries, which manufactures wire harnesses used in M1 tanks, recently became the first Land Systems supplier to achieve process certification through its aggressive implementation of Statistical Process Control (SPC).

Eric E. Smith, Land Systems Vice President-Quality, said that a certified process is one that ensures a product of the required quality because it is manufactured properly, not just because it is inspected. "When a process becomes certified," Smith said, "inspection both at the source and at our receiving docks becomes redundant."

Land Systems has used SPC techniques for two years to improve quality and productivity and, recognizing the benefits, strongly encouraged suppliers to adopt them.

"Future contracts will be awarded to companies that win with the highest quality and lowest cost," said James V. Mercurio, Land Systems Vice President-Material. "One of the most significant opportunities to improve quality and reduce costs is through the use of SPC."

Cherokee Nation Industries, a small business located in Stillwell, Okla., won its contract with Land Systems through competition with some of the nation's giants in wire-harness production. It has achieved Land Systems' highest quality rating and has been recognized by other customers for the quality of its products.

"This is what makes their results so impressive," said Thomas A. Bledsoe, Material Director. "They used SPC to achieve very substantial improvement in an already excellent product."

In recognition of the CNI effort, Smith presented a plaque to Cary Wyatt, Chief Executive Officer of CNI, and M1 Abrams baseball hats to the CNI Manufacturing

and Quality team that works on the Abrams harnesses.

"We have dedicated our company to deliver the best possible products to our customers and feel the implementation and management of SPC are substantial moves to ensure that goal," Wyatt said.

Earl M. Mustonen, Land Systems Director of Quality Assurance Programs, said, "SPC has paid off in higher quality at CNI, and I am confident that this company is just the first of many Land Systems suppliers that will soon be harvesting the benefits of SPC."



Quality Recognized. Eric E. Smith (left), Land Systems Vice President-Quality, presents a plaque to Cary Wyatt, Chief Executive Officer of Cherokee Nation Industries (CNI).





**Agile Wind Tunnel Tests.** Test model of the Agile Falcon F-16 derivative, as currently proposed, is shown in the wind tunnel at the National Aerospace Laboratory (NLR) in Amsterdam, the Netherlands.

## Initial Agile Falcon Wind Tunnel Tests Completed by Dutch

Initial aerodynamic testing of the baseline configuration for the Agile Falcon F-16 derivative was completed recently in the high speed wind tunnel facilities of the Dutch National Aerospace Laboratory (NLR) in Amsterdam.

The predevelopment testing was conducted to collect data on the current Agile Falcon aircraft concept and establish a foundation for performance comparisons in future tests. The NLR test evaluated the current design at speeds varying from Mach 0.6 to 1.2.

"The tests marked the first time in the F-16 program that we've conducted configuration development activities in a facility outside the United States," said A. Dwain Mayfield, Fort Worth's Agile Falcon Program Director. "This clearly demonstrates the multinational nature of the proposed codevelopment effort."

The main aerodynamic enhancement proposed under the Agile Falcon concept is the incorporation of a larger-area wing for increased maneuverability. The derivative design will also incorporate graphite-bismaleimide composite structure, very high speed integrated circuit (VHSIC) avionics and an improved performance engine.

The initial aerodynamic concept was scheduled to begin additional wind tunnel testing at NLR in late July.

## Management Group Awards Scholarships To EB Dependents

The Management Association at Electric Boat has awarded college scholarships to three dependents of association members.

The winners are Patricia Ann Gagnon, daughter of Jack J. Gagnon, General Superintendent in Piping Trades; Carol Patricia Morosky, daughter of Paul A. Morosky, Engineering Chief in Systems Technology; and Kathleen A. Sammataro, daughter of Robert F. Sammataro, Principal Engineer in the Trident Nuclear Project.

Prize awards to the three top winners and nine runners-up total almost \$13,000 in the annual scholarship competition.

### Our Commitment As Employees

- *We will treat one another fairly and with the dignity and respect due all human beings.*

(From the General Dynamics Standards of Business Ethics and Conduct.)

## First Foreign Agile Falcon Engineer Arrives In Fort Worth's Multinational Design Effort

A major milestone in the Agile Falcon F-16 derivative program was reached recently when the first European engineer arrived in Fort Worth to join the multinational design effort.

Anders Bonde, an employee of the Danish firm Per Udsen, will work in Fort Worth for about 18 months under terms of an agreement between General Dynamics and the government of Denmark.

"General Dynamics has invited engineers from Danish, Belgian, Dutch and Norwegian industry to work side by side with Fort Worth employees as we define the Agile Falcon configuration and associated mid-life F-16 updates," said A. Dwain Mayfield, Agile Falcon Program Director.

"This marks a new step in the international F-16 program. This phase of the program will involve European industry in the codevelopment of all technologies for the Agile Falcon concept, including advanced composite structures, very high speed integrated circuit (VHSIC) avionics and aerodynamic innovations," Mayfield said.

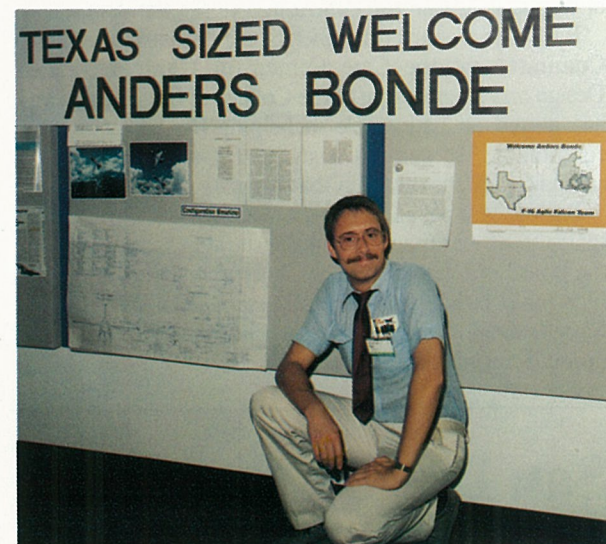
General Dynamics proposed the Agile Falcon effort in July 1987 as a five-nation cooperative upgrade program for the F-16. Predevelopment work will continue in Fort Worth through 1989. European industry partners will eventually work on the program on-site in their own countries, toward a planned production date of 1995.

Anders Bonde has been with Per Udsen since 1984, working in manufacturing engineering, research and development functions related to Per Udsen's coproduction of pylons for the present F-16 program. He holds a

bachelor's degree in mechanical engineering from the Engineering College of Elsinore, Denmark, and has also served in the Danish Air Force.

At Fort Worth, he will be working on the initial design of composite structure for the wing of the F-16 derivative. "I'm looking forward to it. It's the sort of thing I've always wanted to do," Bonde said.

By the end of the year, approximately 12 European engineers from the four nations will be assigned at Fort Worth, Mayfield said.



Danish Engineer Anders Bonde

## Four West Coast Employees Win Top Award Given to Professional Women in San Diego

Four General Dynamics women have been honored by the San Diego County YWCA as recipients of the 1988 Tribute to Women and Industry (TWIN) award, one of the most prestigious awards made to professional women in San Diego.

Deanna M. Graumann of Data Systems Division-Western Center, Cynthia L. Henson of Electronics, Nancy J. Kuhn of Space Systems and Laurie D. Lott of Convair were nominated by their divisions for their outstanding professional accomplishments.

As the Software Systems Office (SSO) Research and Development Program Manager for Data Systems Division-Western Center, Graumann was honored as a primary contributor to a plan that launched a new business for DSD; she also developed a software research and development program, which was the primary factor in

obtaining one current contract with strong prospects for two additional contracts. Graumann is an executive committee member for the Ada/Jovial Users Group, a working group concerned with government programming language standards, and a program committee member for the National Conference on Ada technology, a government-sponsored symposium.

As Management and Administrative Systems Manager at Electronics, Henson is responsible for the Division Directives system, implementing the Electronics Division information resource plan and approving and acquiring all personal computers for the division. She received an extraordinary achievement award in 1987 for outstanding coordination of the division's Management Effectiveness Program (MEP). She is also active in the National Management Association, National University Alumni Association and the Data Processing Management Association.

Kuhn is Chief of Forecasting Information Systems for the Space Systems Finance department and is responsible for the Space Integrated Manufacturing System as well as other major new financial systems. She successfully transitioned financial systems from Convair to Space Systems, which was considered a major task associated with the realignment of the divisions. Kuhn has been active in a number of community volunteer activities for the San Diego Blood Bank, the El Cajon Valley Convalescent Center for Alzheimer patients, the San Diego Public Library System and her synagogue.

Lott is Lead Structural Design Engineer on the Tomahawk BGM-109D, the submunitions-dispensing variant of the Convair-built cruise missile. She leads a technical team in the design and development of the mission payload section and the submunition-dispensing modules, which are crucial elements in the development of the Tomahawk variant. She was also responsible for integrating the technical programs of a major subcontractor into the overall project.

General Dynamics in San Diego has participated in the TWIN program by supporting the program financially. Several former TWIN honorees are active in YWCA community programs.



(Clockwise from Top) Nancy J. Kuhn, Deanna M. Graumann, Cynthia L. Henson and Laurie D. Lott

## Coast Guard Reserve Unit Commends John F. Heasel

A Detroit unit of the Coast Guard Reserve recently sent a letter to a Land Systems employee commending him for his training support.

John F. Heasel, Senior Systems Analyst in Management and Technical Information Systems, was thanked for his assistance in training members of the reserve in coastal navigation.

In the letter of commendation, Lt. Cmdr. G. W. Patrick

said that limited resources sometimes force reserve units to seek out other members of the Coast Guard family to accomplish their goals. "When local experts were needed for our navigation classes," he wrote, "it was only natural that we go to experts from the auxiliary, such as yourself."

As a member of the Coast Guard auxiliary, Heasel has taught coastal navigation for 13 years.



## Computer Chip Designed by GD Is Powerful, Fast . . . and Small By Joe Stout

A team of electronics engineers at Fort Worth recently completed development of the first General Dynamics-designed Very High Speed Integrated Circuit (VHSIC) device — a small chip that, at its rated clock speed, executes more than two million instructions per second.

The new chip is approximately 35/100ths of an inch square and contains approximately 110,000 transistors.

The chip meets all requirements of MIL-STD-1750A, a Department of Defense (DOD) standard specifying the operating instructions for a 16-bit military computer. "Its processing speed, power consumption and self-test capability compare favorably with several other companies' MIL-STD-1750A chips which are under development or already on the market," said Lew M. Jobe, Corporate Director-Microelectronics Technology.

The accomplishment is significant because the chip's designers are systems engineers, not experts in the highly specialized field of integrated circuit design.

"In addition, they are employed by a company that is known as a prime contractor and systems integrator, not the kind of firm that would normally be expected to produce its own computer chips," Jobe said.

From the standpoint of future design capability, this means that General Dynamics can participate in programs

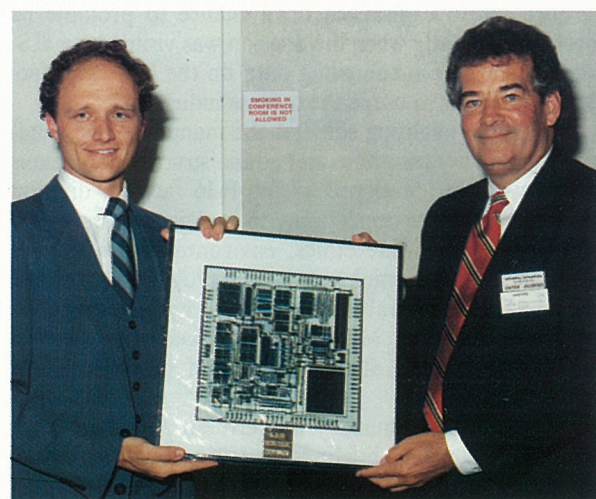
requiring the application of VHSIC and Very Large Scale Integrated (VLSI) Circuit technology using the kinds of engineering talent that the company already has in place, he said.

The DOD has made the development and application of VHSIC technology a high priority for incorporation in future weapon systems. The technology will allow significant downsizing of electronics and avionics systems, thereby saving weight, space and power while providing state-of-the-art performance and capability in advanced military equipment.

Fort Worth's achievement was made possible by an integrated circuit design tool supplied by Silicon Compiler Systems of San Jose, Calif. The "tool," called a silicon compiler system, is "an expert system software program which encapsulates the knowledge base needed to generate an integrated circuit, given a set of design requirements entered into the system by the engineer," said Ross Hirschi, one of the engineers who led the effort.

The tool speeds the process of integrated circuit design by automating many of the design tasks, Hirschi said.

"We ended up with an excellent product," Hirschi said. "In fact, several other companies have expressed interest in licensing our chip design."



**VHSIC Design Completed.** Fort Worth engineer Ross Hirschi (left) displays mounted, greatly enlarged photograph of new VHSIC chip with James T. Hammock, President of Silicon Compiler Systems. Hammock's company provided a sophisticated design tool to Fort Worth under a cooperative agreement with General Dynamics.

## Foreign Object Damage Is of Grave Concern In Assembly of Missiles at Convair By Julie C. Andrews

Foreign object damage (FOD) has generally been considered a serious problem for aircraft. At Convair, it also is of grave concern for missiles.

Preventing foreign objects from entering missile access doors during assembly has had a high priority at the division. "Plugging the holes" is not a simple matter.

A Convair Quality Circle project initially explored using "nerf ball" material to stuff missile access doors. It refined the concept to come up with a complete line of missile cavity inserts made of elastomeric polyurethane-coated foam that can close any shaped hole without chipping or flaking — and earned a patent in the doing.

"Missile mechanics used to plug the holes with paper and tape," said Irene Fretz, who is Convair's Advanced

Programs foreign object damage (FOD) prevention coordinator. "The Quality Circle wanted to find cost-effective ways of preventing FOD without sacrificing function."

With simple Velcro fasteners, the FOD covers are attached to a stand that contains the appropriate quantity and kind for each work station. All holes are plugged as assembly work continues.

The classic definition of FOD, Fretz said, is any object that is left in the vicinity of or in the migratory path of an aircraft's engine inlet or control system. Since 1982, however, FOD prevention has been a standard in all government contracts — missiles included.

The definition of FOD has evolved to include any foreign object, no matter how small, that may have been allowed to invade the product. FOD can be something as small as a piece of solder or as large as a tool left inadvertently in an adjacent work space. In the worst cases, FOD can cause a system failure.

Fretz works closely with manufacturing and all other functional areas that are involved in material handling — the central focus of FOD prevention. FOD awareness is considered a daily regimen for everyone on the factory floor.

"A vigorous FOD prevention and awareness program is a key element in our manufacturing processes and one of the most important requirements to build quality into the product," said David W. Cormany, Advanced Programs Manufacturing Product Line Director. "This has never been more important than in today's cost competitive climate."

Advanced Programs is using some inexpensive, simple, but innovative material handling devices and procedures to guard against FOD. For example, missile mechanics slip subassemblies and parts into zippered acrylic bags labeled with the part number. The part travels all the way through the manufacturing process in the bag. At the end, the bag is laundered and recycled to be used again.

Mechanics also use simple, inexpensive stands of the kind found in a dentist's office to hold small parts, paperwork or tools. These stands can swing up against the assembly to allow the worker ease of use, then swing away to keep the items clear of the assembly and ensure that nothing is resting above the assembly that could fall onto it.



**Irene Fretz Selects FOD Cover**

## Women Engineers Very Active at Fort Worth

A group of Fort Worth employees played a major role in establishing a chapter of the Society of Women Engineers (SWE) in the division's area.

"The idea of forming a SWE section was born at the division and our first meetings were held at the plant," said Caroline T. Rogers, a stress analysis engineer and officer of the group. "In the last two years, our chapter has grown so that about a third of its members are now from outside the company."

The chapter's slate of officers continues to consist primarily of Fort Worth employees, she said.

The chapter has been very active, sponsoring educational programs for professional and student engineers.

Members have also served as substitute teachers in public schools, participated in a division-sponsored Math and Science Teacher Symposium and assisted with a bus trip to the University of Texas at Austin for high school students who are interested in engineering careers.

SWE is a non-profit, educational service organization of graduate engineers and persons with equivalent engineering experience. SWE's goals include informing young women about opportunities in the field, Rogers said.

The organization has chapters nationwide. Engineers interested in joining SWE should contact the nearest chapter, Rogers said.

## Employees Dominate Corporate Olympics Held in Ogden, Utah

A group of Fort Worth employees assigned at Hill AFB in Ogden, Utah, won 11 gold and eight bronze medals to place first in a recent Corporate Olympics competition held to raise funds for the newborn intensive care unit of a local hospital.

The event raised more than \$20,000 to purchase equipment required for the care of infants with special needs at St. Benedict's Hospital in Ogden.

A total of 35 General Dynamics employees were involved in the fund-raising event. Software engineer Kurt R. Manship won three of the team's gold medals. Teams from 46 companies participated in the games, which were held over several days.



**Corporate Olympics Race.** Company employees Blaine R. Bell, Billy H. Wright and David M. Teel, (left to right) in blue T-shirts, represented General Dynamics in a five-kilometer race held as part of the recent Corporate Olympics competition in Ogden, Utah.

### GENERAL DYNAMICS

## World

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## Fort Worth's Manufacturing Programs Impress U.S. Navy Team By Joe Stout

Fort Worth capitalized on a chance to promote its programs recently when the division was visited by a U.S. Navy team that is compiling data on the best manufacturing practices in use in the defense industry.

Besides highlighting some of the manufacturing, engineering, quality assurance and administrative innovations that have been developed at the F-16 factory, division personnel used the opportunity to explain progress made in the corporatewide ethics, environmental resources management and employee survey programs. The visit was the first of several to be conducted by representatives of the Navy's Best Manufacturing Practices Office in Washington, D.C., at the facilities of major weapons system contractors.

The team of 14 military and civilian personnel spent four days attending briefings, watching factory demonstrations and touring production areas at Fort Worth. At the end of the survey the team made presentations of its own, identifying more than 30 Fort Worth programs and projects as candidates for a list of industry's best, most commendable practices.

The team was divided into three subgroups that examined management, design engineering and manufacturing practices at the division.

The ethics program, environmental resources management program and 1986 employee survey, plus the activities that have followed the Employee Survey, were among management practices that impressed the team, said Harry Englert, Senior Planning Specialist in the Manufacturing Development Department, who coordinated Fort Worth's preparations for the visit.

The Navy researchers seemed to take a particularly favorable view of the commitment that General Dynamics management has made to the ethics program, said Jerry A. Sills, Fort Worth's Ethics Program Director. "The briefings focused on the objectives of the program and the implementation process, and included corporate-level data concerning the program's effectiveness and level of employee participation," he said.

William C. Rosenthal, Fort Worth's Environmental Resources Management Program Manager, said his briefing covered the corporate goal of eventually achieving zero discharge of hazardous wastes at company facilities, as well as Fort Worth's plans toward meeting the goal.



**Facility Orientation.** Fort Worth facilities planner Jeff Mathews uses a scale model of the F-16 factory to explain the aircraft final assembly procedure to members of the Navy's Best Manufacturing Practices survey team. Facilities engineers use the model in planning layout changes to be made on the factory floor.

The survey team took special interest in Fort Worth's concept of using an environmental resources management team with representatives from different division departments to develop and implement the plan, Rosenthal said.

Employees from many Fort Worth functional areas participated in presentations to the team on such issues as aircraft configuration and change management, product integrity, subcontract management, quality assurance, statistical process control, computer-aided design capability, quality circles, robotics and manufacturing development projects.

"In their debriefing, the team members indicated that they especially liked what they saw in regard to robotics applications, the Engineering Department's use of computers for design, our approach to engineering design analysis and our Advanced Machining System," Englert said.

"They were impressed with our 'quality first' attitude and our willingness to make changes to improve an already excellent product," he said.

The survey team, headed by Leo Plonsky of the Naval Industrial Resources Support Activity, also included

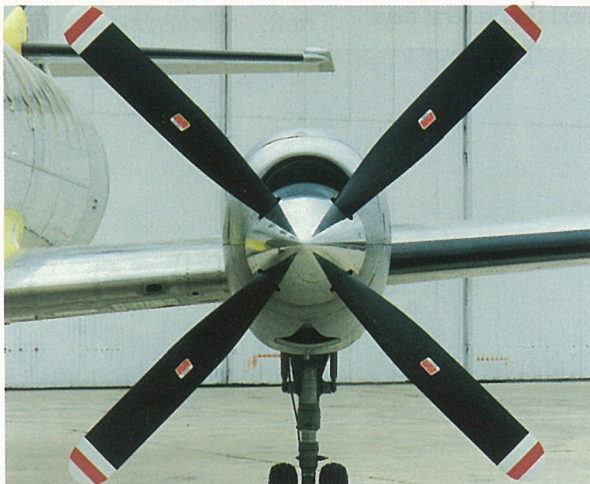
Ernest A. Renner and Cmdr. Richard Purcell of the Best Manufacturing Practices Office. Other members were from the Department of Commerce, NASA's Goddard Space Flight Center, Naval Air Systems Command, the Navy Research Organization, Mare Island Naval Shipyard and the U.S. Army.

The Best Manufacturing Practices Program was established by the Navy in 1985 to help industry enhance the reliability, maintainability and quality of the military equipment it produces. Previous surveys centered on electronics-related manufacturers, including Pomona.

The team that visited Fort Worth will incorporate its findings in a summary report and a Best Manufacturing Practices data base that will be made available to the entire industry.

The Navy also sponsors Best Manufacturing Practices workshops to promote technology sharing and industry education.

"The Navy chose to visit Fort Worth mainly because we have done some innovative things," Englert said. "A secondary reason is the fact that we are working on the Navy's A-12 Advanced Tactical Aircraft program."



**McCauley Propeller**

## McCauley Propellers Selected by Fairchild For Metro Airlines

McCauley propellers have been selected as standard equipment for Fairchild Metro III regional airliners.

McCauley propellers were selected after an extensive evaluation of life-cycle costs, according to David Bartles, Executive Vice President of Fairchild Aircraft Corporation. "In addition, their lighter weight and the availability of service parts made the McCauley propellers a value added choice for our Metro III," Bartles said. The McCauley regional airline propellers were designed for airlines that want to reduce operating costs by significantly reducing the cost of propeller maintenance, according to Charles G. Rocco, McCauley Accessory Division's Manager of Marketing and Product Support.

Beginning in August, McCauley will offer Metro III propeller conversion kits to the airlines through Fairchild, Rocco said. He said the price of the conversion will be approximately the same as a major overhaul of competitive propellers. There are more than 350 Metro IIIs in service with regional airlines.

McCauley, which is celebrating its 50th anniversary, is a division of Cessna Aircraft Company and is headquartered in Vandalia, Ohio.

## Electric Boat Is Promoting the Use of Robots To Teach Science at Neighboring Center By Graham Gavert

Electric Boat has proved it not only is interested in science education but also that it is a good neighbor.

The Thames Science Center, an organization dedicated to preparing programs on subjects in science and the environment, is located across from the Groton shipyard, on the New London, Conn., side of the Thames River. When the center approached the division in 1986 to solicit support for a program involving robots, called Project RobotACTS, Electric Boat was quick to respond, donating start-up funds and pledging further aid in 1987.

The division's participation catalyzed, prompting greater support among other industrial organizations.

In acknowledgment of support by Electric Boat, the Thames Science Center acknowledged Electric Boat's support with an award to Fritz G. Tovar, Vice President and Electric Boat General Manager, during the center's 40th anniversary celebration in June.

The center's director, Jane A. Holdsworth, praised Electric Boat for its leadership in supporting the successful development of Project RobotACTS.

Project RobotACTS has grown in the past two years from a series of demonstrations with a Gemini robot named Tharogem I, used to excite students about the principles of physics, to an expansive junior high school curriculum that teaches the theory behind Tharogem I, as well as guiding students in assembling simple robots.

RobotACTS is a six-part course in which students experiment with robots using electricity and magnetism, mechanics of energy and motion, wave motions, sound, light and artificial intelligence. Students build several types of robots, each type beginning with a base constructed of Lego building blocks. Different sensors allow the various robots to respond to sound waves, light, touch and ultrasonic stimuli.

The RobotACTS curriculum has been used in two schools and is scheduled for use in 18 other schools throughout the region this fall.

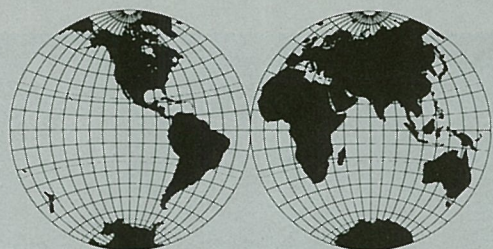
In recognition of its unique character, the program was named one of 23 National Exemplary Programs by the U.S. Department of Education and was featured recently at a reception in Washington, D.C., during National Science and Technology Week.

With support from General Dynamics, the Thames Science Center presented demonstrations on Capitol Hill using Tharogem I and six smaller robots built by students. Other features of the presentation included an interactive video used in the RobotACTS curriculum, exhibits covering some of the experiments and a computer-based learning program on artificial intelligence.



**Robot Examined.** Creig Peterson, a physical science teacher at East Lyme (Conn.) Junior High School, inspects the Tharogem I robot at the Thames Science Center. Peterson is one of the teachers conducting the center's RobotACTS science curriculum, which is supported by Electric Boat.





## Around the World

**CHQ:** Arnold E. DiLaura joined as Engineering Specialist/DIO... August J. Billones as Combat Systems Staff Engineer... Martin A. Olson was promoted to Business & Strategic Planning (UWC) Manager/Washington... Joseph M. Graf transferred from Data Systems/Eastern Center and was promoted to DIO-Project Development Manager.

**Fort Worth:** Gordon W. Bowen was appointed to Program Director... Armand J. Chaput to Engineering Program Director... Charles A. Foster to Logistics Requirements Director... Enrique L. Gomez to International Business Management Director... Jessie G. Arey and Charles W. Smith were promoted to Engineering Project Manager... William C. Atherton to Engineering Program Manager... Michael K. Bagwell to Manufacturing Control Chief... Martin L. Bagwell to Technical Buyer... David Barker to Information Systems Manager... Norbert S. Bolton to Production Management Manager... John S. Brinck, Richard H. Chichester, Brad Draper, Barry L. Ferrell, Estanislado A. Flores, Richard D. Gordon, Robert H. Grove Jr, Dean R. Hayes, Ronald M. Hudgens, Jeffrey D. Hunter, Joy L. Leonhardt, David K. Mellendorf, Sherry A. Oliver, Patrick F. Routa, Daniel O. Santos, Jerome R. Schreiner, Arthur E. Sheridan II, Douglas B. Snider and Robert D. Wyatt to Engineering Chief... Dannie J. Bruce to Production Test Chief... John R. Bryant and Albert C. Soto to Technical Group Supervisor... James D. Chapman, Mark K. Fleet and George C. Moreno to Field Service Engineer... Thomas H. Clark to F-16 Planning and Controls Manager... David M. Coburn to Production Control Manager... Kathleen T. Cook to Buyer... Marc B. Deahl to Procurement Chief... Gordon B. Dobbins Jr., Glenn E. Frick, James V. Sabin, Howard L. Scott, Glenn E. Weissinger and James T. Werner to Engineering Manager... Charles W. Dodgins to Logistics Group Engineer... Stanley J. Effertz to Finance Manager... Gerard F. English Jr. to Manufacturing Control Supervisor... Anthony A. Faoro and Mark D. Schulz to Manufacturing Technology Supervisor... Lonnie E. Floyd to Senior Buyer... David W. Fowler to General Foreman... Clarence L. Galler to Senior Information Systems Specialist... Steven T. Gibson to Tool Planning Chief... Patsy L. Graves and Dana D. Wentworth to Engineering Group Supervisor... Roger L. Harnden to Material Program Administrator... James C. Hoffman to Manufacturing Control General Supervisor... Georgia L. Johnson to Senior Property Management Analyst... Malcolm B. Johnson to Process Planning Specialist... Ralph L. Kragle to Engineering Administrative Manager... Michael J. Lachance to Engineering Administrative Chief... James R. Lamothe and David C. Laurenzo to Project Manager... William J. Lawrence and Carl Swiggart to Quality Assurance Chief... Jerry B. Maynes and Craig A. Williams to Tooling Supervisor... John L. McKinney to Logistics Chief... Linda F. Montenegro to Scheduling Specialist... Shin Kook Park to Field Engineer... Michael A. Phelps to Logistics Group Supervisor... Julianne Richardson to Logistics Administrative Representative... Nathan H. Saunders to Planning Manager... James E. Shidler to Senior Manufacturing Engineering Specialist... Joan Sparks and David Wilson to Financial Supervisor... David L. Stangl to Senior Material Project Administrator... Robert S. Stennett to Logistics Supervisor... Warren K. Stripling to Senior Program Analyst... Juli K. Tysl to Senior Planning Analyst... William P. Vanhooose to Program Specialist... Kevan D. Western to Engineer... Michael R. White to Senior Manufacturing Engineer... David A. Woehl to Quality Assurance Field Engineer.

**Convair:** Danny A. Leever was promoted to Operations Manager... John H. Wines to Manufacturing Operations General Supervisor... Aurelio Enriquez and Terrence D. Swan to Manufacturing Operations Supervisor... Carol J. Moseley and Kenneth D. Wilson to Manufacturing Control Operations Supervisor... Herbert T. West Jr. to Quality Control Chief... Melinda R. Gerschoffer to Quality Assurance Supervisor... Gordon E. Seaburg to Administrative Chief.

**Space Systems:** James T. Heffron was appointed Program Director-Atlas I and II... William C. McPike was promoted to Engineering Manager... James M. Bonner and William T. Fandel to Engineering Chief... F. Bruce Hamen to Base Administrative Service Chief.

**Electronics:** William P. Hargreaves was promoted to Program Manager... Robert V. Crews to Senior Test Engineer... Janet C. Puckett to Purchasing Agent.

**Land Systems:** Mark C. Roualet was appointed to Procurement Quality Assurance Director... James A. Wayne was promoted to Spares Control Chief... Bruce D. Weinberg to Quality Assurance Manager... Kenneth W. Cooper to Manufacturing Program Specialist... Richard G. Bicknell to Maintenance Superintendent... Ralph J. Upton to Foreman.

**Electric Boat:** Richard E. Finnigan was promoted to Weapon Systems Support Manager... Robert A. Walkup to Lifting & Handling Equipment Manager... John V. Leonard to Subcontract Audit Chief... Benjamin Courant to Assistant Program Management Chief... Douglas P. Dalessio to Engineering Supervisor... Robert E. Dubois to Senior Records Section Supervisor... Herbert Halpern and James E. Kelly to Safety Supervisor... George E. Shabenas to Ship Superintendent... Charles Wimberly to General Foreman... Michael A. D'Eugenio and Sandra L. McCarthy to Foreman... William J. Cawley and Thomas E. Veitch to Chief Test Engineer... At Idaho, Janet R. Sullivan to Engineering Supervisor... Robert A. Thomson to Inspection Foreman... At Kesselring, Phillip K. Gallagher to Engineering Supervisor... Robert J. Onken to Inspection Foreman... At Charleston, Richard W. Smith to Foreman... At Quonset Point, Ronald Cross to Material Systems Manager... Bruce D. Pinel to Engineering Chief.

**Pomona:** William A. Nelson was appointed to Program Director... Everett E. Hambly III was promoted to Configuration and Management Specialist... Timothy J. Lardy and Gary W. Panzar to Section Head... Peter B. Muller to Marketing Manager... Craig D. Seasley to Engineering Manager... Newell F. Young Jr. to Senior Project Engineer... Darryl C. Stierna to Superintendent.

**Valley Systems:** Joseph M. Harrison was promoted to Program Manager... Paul H. Heck to Engineering Manager... Edward W. Reinert Jr. to Purchasing Agent... Rebecca R. Rhoads to Section Head.

**Data Systems:** At Western Center, Robert D. Clay and Robert H. Warren were promoted to Engineer Software Chief... Robert J. Foley to CAD/CAM Manager... Samuel T. Wong to Quality Assurance Manager... At Pomona/Valley, Earl V. Talos to Human Resources Chief... David B. Marsala to Project Engineer Chief... At Central Center, Sherrill G. Newsom and Alan E. Sunderland to Business Systems Development Supervisor... At Eastern Center, Paul F. McGlinchey to Engineer Software Supervisor.

**GDSC:** Steven W. Long was promoted to Project Support Manager... C. Arch Smith to Accounting Manager... Albert L. Hardy to Procurement/Subcontracts Supervisor... Richard A. Kaiser to O&M Operations Supervisor... Charlie W. Sabb to O&M Site Supervisor... Ricky G. Taylor to Aircraft Specialist... Maureen M. Murphy to Buyer... Christine E. Liburdi to Program Analyst... Nick L. Gasaway transferred from DSD and was promoted to Human Resources Manager.

**Cessna:** Verne L. Johnson was promoted to Accounting Supervisor... Tracy Cassil to Leasing Representative.



**Pistol Sharpshooters.** Fort Worth security officers J.W. Turpen (left) and J.R. Gonzalez display marksmanship trophy they won.

## Two-Man Fort Worth Security Officer Team Wins Pistol 'Shootout'

Two of Fort Worth's security officers were right on target recently when they won a trophy as a two-person team in a police pistol sharpshooting competition.

J.R. Gonzalez and J.W. Turpen won first place in the National Rifle Association's "Badlands Shootout" police pistol combat match at Edmond, Okla. The competition consisted of target shooting from four distances, using .38-caliber weapons.

The pair scored about 1,100 points out of a possible 1,200, competing against a field of approximately 150 entrants in the sharpshooter class.

The trophy recognizes General Dynamics as their employer, although they entered the event on their own initiative, Turpen said.

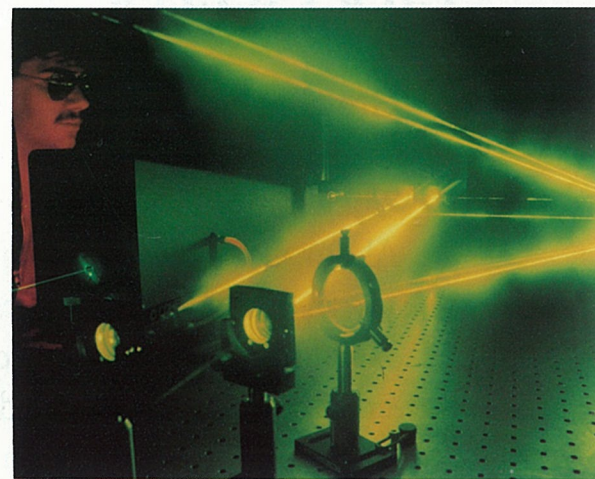
Gonzalez has been with the division eight years and Turpen nine years. Both had public law enforcement experience before joining General Dynamics, and they said they saw many former associates at the pistol match.

Officers from throughout the nation participated.

## Our Commitment To Our Suppliers

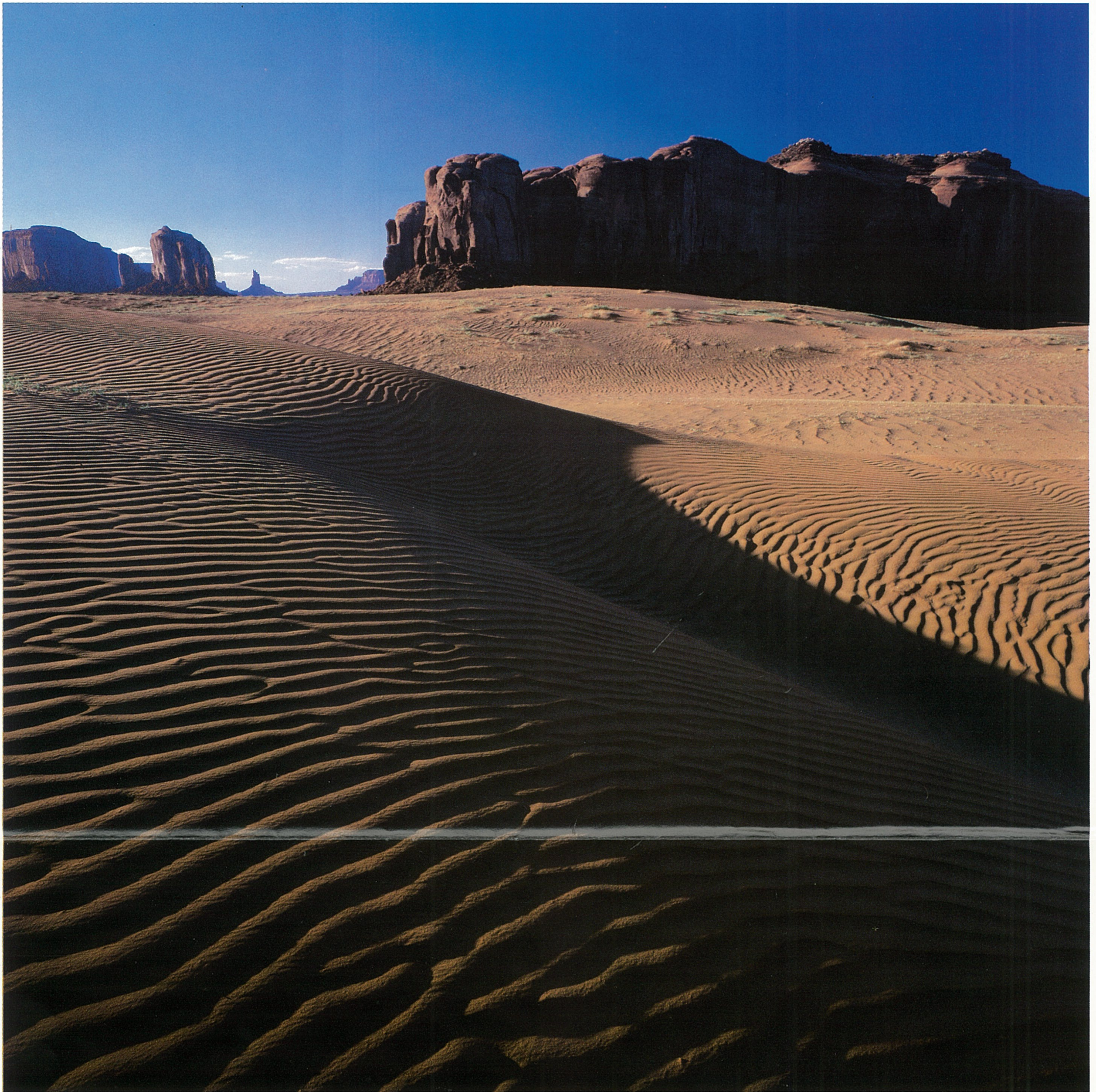
- *We will be the best customer we can be and will emphasize both fair competition and long-lasting relationships.*

(From the General Dynamics Standards of Business Ethics and Conduct.)



**Friend or Foe?** Is it a Soviet T-80 battle tank or one of ours? During combat there is no time for error. At Land Systems, engineer Kenneth J. Barnard demonstrates a potential electro-optics system that may help tank crews identify enemy targets quickly. The system uses laser beams passing through special optical crystals that remove distortions and make real time identifications possible. If research and development efforts prove the system's potential, the optical crystals could become part of the fire control system in the M1A1 Abrams' main battle tank and help future tank commanders and gunners make critical target identifications. Other potential applications include medical imaging and satellite communications.





## This is some of the most productive land in the country.

It is *Dinetah*, The Land of The People, the Navajo People. It is wild and beautiful. And harsh.

Growing corn in this land also grows character in The People. They know about husbanding resources carefully, and about hard work. Their skilled hands make beautiful rugs and jewelry. They also make intricate electronic assemblies.

About 400 Navajo workers and managers in Fort Defiance, Arizona, are building upon a partnership with General Dynamics that stretches back twenty years.

Year after year, our Navajo-made electronics have proven to be first-rate. Our Navajo workers have proven to be able and dedicated. And our Navajo plant has proven to be profitable, for us and for the Navajos.

In 1989 we will open our second plant on Navajo land, employing nearly 200 more Native American workers. The land of the Navajo may look wild and harsh.

But for business, it is some of the most productive land in the country.

**GENERAL DYNAMICS**  
*A Strong Company For A Strong Country*



## Weekly Company Newsletters to Explain Benefits of Dynaflex Program

A series of weekly newsletters explaining Dynaflex, General Dynamics' new flexible benefits program, will be mailed to eligible employees in September. The newsletters will introduce the plan and explain medical benefits, reimbursement accounts, life insurance and long-term disability.

The flexible benefits program begins Jan. 1st and will cover all nonunion active employees. Dynaflex offers many additional options to those employees' current General Dynamics benefits program.

Meetings to explain the enrollment procedure will begin in late September and run through October. Each em-

ployee will receive a personalized workbook containing an enrollment form. Trained General Dynamics personnel will answer questions and demonstrate how to fill out the forms. A video will be shown that highlights key features of Dynaflex.

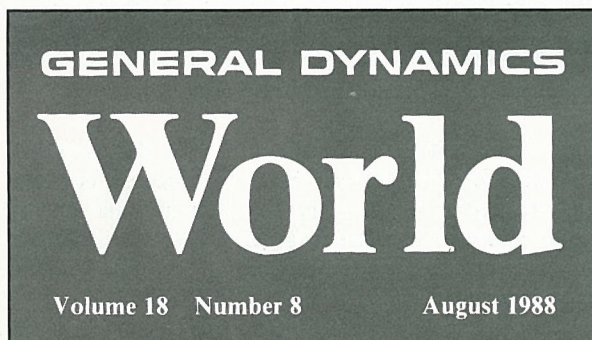
After determining the benefits best suited for them, employees will complete the forms and return them for processing. Enrolled employees will receive confirmation statements listing the benefits they have selected.

Flexible benefits will permit employees to tailor their benefits to their needs while helping General Dynamics contain costs. The company will give each employee a

benefit dollar allowance to buy medical and life insurance and other coverage. Reimbursement accounts will be made available so that employees may pay for expenses such as eye care and dependent care out of salary before taxes.

General Dynamics is preparing for the switch to flex benefits by meeting with consultants, modifying the company's personnel and payroll system, preparing explanatory material, training employees who will staff enrollment meetings and setting up "Flex Infolines" to answer employees' questions.

The "Flex Infolines" will open in September in conjunction with the first newsletter mailing to employees' homes.



## James Turner Named Successor to Tovar At Electric Boat

The appointment of James E. Turner as Corporate Vice President and General Manager of Electric Boat Division in Groton, Conn., was announced Aug. 17th by Stanley C. Pace, Chairman and Chief Executive Officer.



Turner

Company since January 1987. A 1956 engineering graduate of Virginia Polytechnic Institute, he joined Newport News in 1959. In 1975, he moved to Westinghouse Corporation, where he later served as General Manager of the Nuclear Components Division. He rejoined Newport News in 1981 as Vice President-Technology.

Pace said that Turner will assume his new responsibilities on Sept. 6th and will report to James R. Mellor, Executive Vice President-Marine, Land Systems and International.

"Fritz Tovar has been an important and consistent contributor to General Dynamics' success and to the high quality of our submarine production effort," Pace said. "We are fortunate to replace him with someone having the demonstrated experience and proven abilities of Jim Turner."

Turner, 54, will succeed Fritz G. Tovar, a 13-year General Dynamics veteran who headed the submarine construction shipyard since 1981. Tovar, 65, had earlier announced plans to retire.

Turner had been Executive Vice President-Operations at Tenneco's Newport News (Va.) Shipbuilding



The U.S. Navy's Cessna T-47A Citation Trainer

## U.S. Navy's Fleet of 15 Cessna T-47A Citations Flies 50,000 Accident-Free Hours

By Dean Humphrey

The U.S. Navy marked a major milestone in its use of Cessna Aircraft Company's T-47A Citation jet training aircraft recently in ceremonies at the Pensacola (Fla.) Naval Air Station. Navy and Cessna officials celebrated 50,000 hours of accident-free operation of the T-47A in the Undergraduate Naval Flight Officer (UNFO) program.

The 15-aircraft fleet is used to train Naval Flight Officers in operational procedures for airways navigation, radar navigation and radar intercept.

The T-47As, derivatives of the Citation S/II business jet, fly 25 to 30 sorties daily and consistently achieve a mission completion rate higher than the 95 percent required by the Navy, while flying up to 1,600 hours monthly.

Cessna's five-year service agreement with the Navy encompasses a training and support program and includes the 15 aircraft, radar simulators and pilot services. The Navy is expected to exercise a three-year extension of the

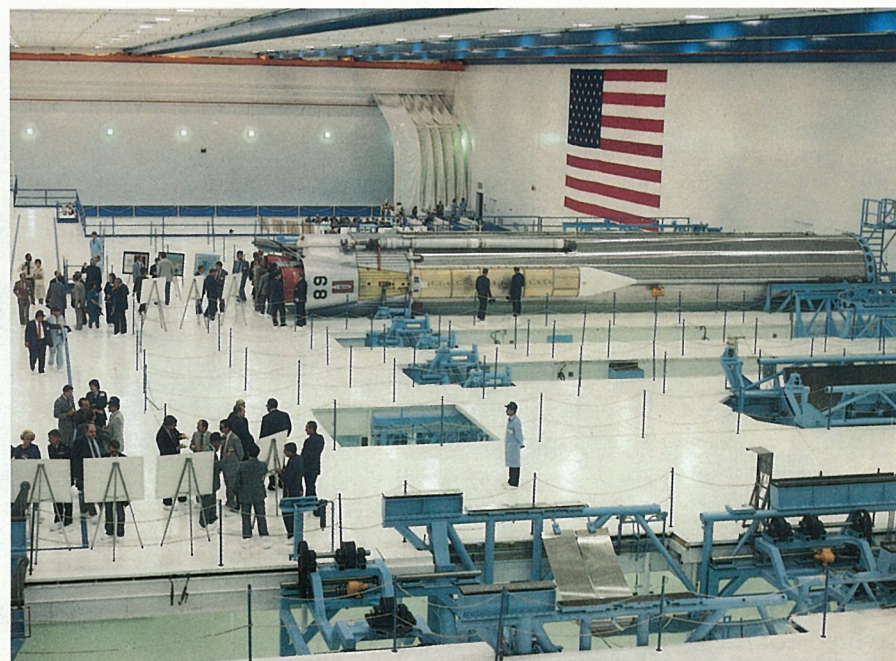
program when the initial contract expires Oct. 1st.

The T-47As use Pratt & Whitney JT15D-5 engines and are strengthened to withstand high-speed, low-level flight and high "g" combat training maneuvers. They are equipped with the multimode AN/APQ-167 tactical radar developed by Cessna and Emerson Electric specifically for the Navy training mission.

Pilots and mechanics for the aircraft are provided by Northrop Worldwide Aircraft Services, under the direction of Cessna, the prime contractor.

The ground radar simulators, developed and maintained by Cessna and Singer-Link, operate 16 hours a day and have exceeded the 94 percent availability requirement with monthly rates as high as 99 percent.

More than 100 Cessna and subcontractor personnel support the unique "turnkey" Navy training contract.



**Space Systems Production Facility Dedicated.** Space Systems Division took a crucial step recently when it dedicated its newly refurbished launch vehicle production facility at the Kearny Mesa plant in San Diego. Some of the 3,500 employees and guests who attended the ceremony are shown during the festivities in photo at left. Guests wore special footwear to enter the clean room, in photo at right, in which Titan/Centaurs will be assembled. (See related story on Page 2.)



## USS San Juan Joins Fleet with Bilingual Flavor at Groton By Graham Gavert

The fast-attack submarine USS *San Juan* was commissioned by the Navy Aug. 6th and was welcomed into the fleet in English and Spanish.



**Governor Hernandez-Colon**

The bilingual flavor of the ceremony was intended to show that the new ship bridges the cultures of Puerto Rico and the United States in a common commitment to democracy and freedom.

USS *San Juan* (SSN 751) officially joined the Navy at the Naval Submarine Base in Groton, Conn., also the home of the Electric Boat shipyard that built her.

The ship's commanding officer, Cmdr. C.B. Young, delivered the welcoming address with a mixture of English and Spanish, and Cmdr. Joseph A. Gerraro, Catholic chaplain at the Naval Submarine Base, Pearl Harbor, gave the benediction in both languages.

Governor Rafael Hernandez-Colon of the Commonwealth of Puerto Rico, the principal speaker, stressed the importance of USS *San Juan* as a symbol for the protection of democratic principles. He noted that, unlike the two previous ships to bear the name, one of which (Armored Cruiser 54) earned 13 battle stars during World War II, the submarine was conceived and built in a time of peace.

The similarity among the ships, he said, is that they have served and will continue to serve in the defense of peace in a commitment to protect a belief in democracy.

"I am reminded of the common customs and beliefs that bind mainland Americans to their fellow citizens in Puerto Rico," Hernandez-Colon said. "Our political traditions in Puerto Rico are much like yours. We cherish the values of democracy and personal liberty. And as an island with a Caribbean perspective, we also understand the dangers of totalitarianism and the horrors of oppression."

"Today, the world is looking toward the Caribbean basin and Latin America, where experiments with democracy



**Fast-Attack Submarine USS *San Juan* during Commissioning Ceremonies at the Naval Submarine Base at Groton, Conn.**

must succeed," the Governor said. "Our democratic institutions provide a beacon of hope to those countries struggling to bring an end to military rule and to those that are clutching their embattled freedoms."

Other speakers included Luis A. de Casenave, Executive Director for Culture, standing in for the mayor of San Juan; the Hon. Sam Gejdenson, United States Representative from Connecticut; Rear Adm. John S. Claman, Supervisor of Shipbuilding, Conversion and Repair; James R. Mellor, General Dynamics Executive Vice President-Marine, Land Systems & International; and Sherrill Diane Perkins de Hernandez, sponsor of the ship.

De Hernandez spoke movingly of the "unbroken chain of dedication to San Juan" that the commissioning ceremony puts in motion, describing the day as marking the convergence of individuals from the United States, Puerto Rico and other corners of the globe, who come together as officers and crew of the USS *San Juan* in one collective purpose.

"It is difficult for those of us who don't go to sea to fully understand that psychic bond that is established between a seaman and his ship," de Hernandez said. "Ships absorb the great energies and emotions of their crews into their

steel. Today, the plank owners of the USS *San Juan* start to shape the feel of their boat. Her steel is new and impressionable. Please make sure that the first layer of your collective energies is good. Make sure the steel absorbs your dedication, your courage and your kindness to one another."

She then presented Commander Young with an oil painting that she had done of a well-known lighthouse on the southeast coast of Puerto Rico, with the comment: "May it always guide you safely home."

Before setting the watch and raising and lowering the masts, a commissioning message from Vice Adm. Kinnaid McKee, Director, Nuclear Propulsion Directorate, was read to Commander Young: "The shipbuilder has delivered a boat; it's your job to make her a warship." This was followed by the release of volumes of red, white and blue balloons, which sailed high into the air and continued to dot the sky for several minutes.

USS *San Juan*, considered a greatly improved version of the 688-class fast-attack submarine, is the first submarine to feature a completely new combat system, retractable bow planes and a hardened shell to allow the ship to break through ice when surfacing.

## Space Systems Takes a Crucial Step with Refurbished Facility By Julie C. Andrews

Secretary of the Air Force Edward C. Aldridge Jr. called Space Systems' newly refurbished launch vehicle production facility a "crucial step" in the recovery of the U.S. space program during dedication at the Kearny Mesa plant in San Diego July 26th.

Dr. Alan M. Lovelace, Vice President and Space Systems General Manager, presided as Herbert F. Rogers, General Dynamics President and Chief Operating Officer, and Aldridge cut the ceremonial ribbon.

"With the dedication of this facility, we have reached another crucial step in the full restoration of America's access to space," Secretary Aldridge said. "This wonderful facility clearly indicates your commitment to the future of America's space program."

Secretary Aldridge announced May 3rd that the Air Force had selected Space Systems' Atlas II to launch 11 communication satellites for the Air Force's Medium Launch Vehicle II program. The new facility will support Atlas II as well as the Air Force's Titan IV, for which Space Systems is building 10 Centaur upper stages. The facility also will support Atlas I and IIA, which Space Systems is marketing to commercial customers.

"We intend to establish this division as the pre-eminent supplier of high quality, low-cost launch vehicles," Lovelace said. "An outstanding product can only be produced by an outstanding work force. Such a work force is the Space Systems team."

Approximately 3,500 Space Systems employees, invited guests and news media attended the outdoor ceremony.

The ribbon-cutting took place at the entrance of the new 80,000-square-foot clean room, the centerpiece of the facility. Guests put on special footwear to enter the clean room for a closer look at the gleaming white environment in which Titan/Centaurs will be assembled. Workers will enter the clean room through a dressing area and will wear special clothing to guard against contamination.

The clean room is rated Class 100,000, which means its air is filtered and temperature- and humidity-controlled so that no dust particles are visible on the surface. Launch vehicles in production rest in docks that rotate, allowing all work to be done at dock level.

The facility also includes a 30,000-square-foot high-density storage area and a 15,000-square-foot office mezzanine overlooking the clean room. The balance of the facility, a 120,000-square-foot general work area, has received new floor and wall surfaces, improved production flow and new support equipment.

The dedication marked completion of the largest and most visible facilities improvement undertaken by Space Systems. Other company production locations are also undergoing extensive improvements, including Air Force Plant 19 in San Diego, Space Systems facilities at Vandenberg AFB, Calif., and Cape Canaveral, Fla., and General Dynamics Services Company's Harlingen, Tex., facility.

Additional manufacturing technology improvements are planned at these locations and include a computer network that interfaces with over 40 resistance welding

stations at AF Plant 19. Automatic welding, in-line automated radiographic inspection and a laser system that cuts tank sections without extensive manual trimming will reduce costs associated with building both Atlas and Centaur tanks. An automatic riveting system has been installed at the Harlingen facility, where the jettisonable components such as the nose fairing and adapters will be built.



**Space Systems Ribbon-Cutting.** Herbert F. Rogers, President and Chief Operating Officer (left), and Secretary of the Air Force Edward C. Aldridge Jr. cut the ribbon to the newly refurbished launch vehicle production facility as Dr. Alan M. Lovelace, Vice President and Space Systems General Manager (right), finishes the "countdown."

## Space Systems Is One of Three Winners for Contract in ALS Program

Space Systems has been awarded a contract by the U.S. Air Force for system design and technology demonstrations for the Advanced Launch System (ALS) Phase II. ALS is a jointly managed U.S. Air Force and NASA program whose goal is to develop a family of expendable launch vehicles capable of placing a wide range of payloads into orbit at a significantly lower cost.

"Being selected for the next phase of development for the Advanced Launch System provides a key opportunity for Space Systems to play a major role in our nation's next space transportation system," Dr. Alan M. Lovelace, Vice President and Space Systems General Manager, said.

The ALS will provide the United States with a robust, resilient and very low cost launch vehicle system to lift a wide range of future spacecraft, Lovelace said. These missions include potential manned planetary and lunar base activities. Lovelace called the ALS "the necessary first step for the United States to recapture international leadership in space."

Space Systems has been performing technology studies on next-generation space transportation systems such as ALS since 1985. ALS is an outgrowth of the Space Transportation Architecture Study (STAS), a joint Department of Defense and NASA evaluation of national space trans-

portation and technology requirements through the year 2010. Space Systems participated in the STAS program from 1985 to 1987 and was awarded an ALS Phase I study contract in July 1987.

Boeing and the team of Martin Marietta and McDonnell Douglas were the other contractors selected for Phase II. Following completion of Phase II, one contractor will be selected to proceed with full-scale engineering development. Current plans call for a first flight of an ALS in 1996 with initial operating capability scheduled for 1998.



## 2nd Quarter Awards Improve GD's Base In Space, Electronics

Two contract awards in the second quarter have moved the company considerably closer to its goal of a stronger business base in the space and electronics segments of the defense market, according to Stanley C. Pace, Chairman and Chief Executive Officer.

"The Air Force's selection of our Atlas II for its Medium Launch Vehicle II program reestablishes General Dynamics as a leading supplier of launch services for the U.S. Government," Pace said. "This award to Space Systems also enhances our ability to market a version of Atlas II for a widening range of commercial requirements."

"The win by Electronics Division — teamed with Tadiran of Israel — for second-source production of the U.S. Army's Single Channel Ground and Airborne Radio System (SINGARS) is also strategically significant," Pace said. "This is an excellent example of our competing selectively where there are established customer requirements and good prospects for long-term profitability. SINGARS is a high-priority program with total program funding expected to exceed \$5 billion."

"The investments in the SINGARS, Atlas I and Atlas II programs are reflected in the decrease of operating earnings in our Missiles, Space and Electronic Systems and Other lines of business," Pace said. "We believe that these current investments will contribute significantly to future sales and earnings."

The company announced July 20th that earnings for the second quarter of 1988 were \$66.7 million, or \$1.58 per share, compared to earnings of \$125.1 million, or \$2.92 per share, for the second quarter of 1987. Second quarter 1988 results include a net after tax charge of \$33 million or \$.79 per share associated with the SSN 688-attack submarine program at Electric Boat.

Earnings for the first six months were \$172.4 million, or \$4.10 per share, compared to \$230.5 million, or \$5.37 per share, in the same period a year earlier. Earnings for the first half of 1988 include benefits of \$20 million, or 47 cents per share, from tax law changes resulting in reductions of deferred taxes.

Sales were \$2.3 billion for the second quarter and \$4.7 billion for the first half of 1988, compared to \$2.4 billion and \$4.7 billion a year ago.

Funded backlog at the end of the 1988 second quarter was \$16.7 billion and total backlog (funded and unfunded) was \$23.8 billion. Comparable amounts at the same time last year were \$15.3 billion and \$23.3 billion.

Beginning with the first quarter of 1987, the company has reported increasing costs of operations at Electric Boat due primarily to problems related to the installation of a new integrated combat system in the SSN 688-class attack submarine and to higher overhead rates because the company did not win any Fiscal Year 1987 submarine awards.

The Electric Boat second-quarter charge recognizes losses from resolution of the company's Request For Equitable Adjustment (REA) associated with the design and installation of the new combat system, from higher costs of rescheduling work into future periods and from the strike by 10,000 shipyard workers at the Groton, Conn., facility.

## Photographer Wins Prize

Timothy R. Whitehouse, a photographer in Convair's Still Photo department, has won second place in Communicating Through Photography, a national contest sponsored by Professional Photographers of America.

Whitehouse shot his award-winning photograph in an anechoic chamber at Electronics Division. The photo was nationally distributed as a corporate public affairs photo release and ran in the September 1987 issue of *General Dynamics World*.

GENERAL DYNAMICS

## World

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**Future Leaders Counseled.** Stanley C. Pace, Chairman and Chief Executive Officer of General Dynamics, was one of several corporate and political leaders queried on a variety of matters by 193 outstanding high school sophomores during the Hugh O'Brian Youth Foundation International Leadership Seminar in St. Louis. The students represented schools in 50 American states and 20 foreign countries. The theme for the weeklong seminar was "Gateway to the 21st Century: Opportunities Unlimited," and the seminar was designed to nurture the youths' leadership abilities. Pace is wearing a jacket presented to participants by the youth foundation.

## Pomona's Hazardous Waste Control Program Is the Subject of EPA-Sponsored TV Special

Pomona's hazardous waste control program has been receiving area and nationwide recognition as an example of how other industries should clean up their act.

The division's extensive effort to become a nonpolluter has been featured in various environmental, technical and political publications and will be the subject of a Public Broadcasting System special television presentation this fall titled "There is a Better Way," sponsored by the Environmental Protection Agency.

"Our success in eliminating hazardous material discharges is a combination of commitment and funding," said Denny J. Beroiz, Manager of Environmental Resources. "Our goal has been to either recycle or eliminate any possible discharges of hazardous materials into the surrounding Pomona Valley."

Further recognition came last month when Mayor Tom Bradley of Los Angeles announced a city program to eliminate discharge of hazardous waste and encouraged private industry to follow suit. He cited Pomona as an example of what should be done throughout Southern California to prevent environmental damage.

Following the mayor's press conference, the Los Angeles CBS affiliate, KCBS, Channel 2, filmed a report on the Pomona program.

"We have made an intensive effort to exceed the requirements set down by the Environmental Protection Agency," Beroiz said. "Aside from the obvious benefits, our proactive response will save the company money by implementing procedures which will probably be required by the EPA in the future."

Pomona began its efforts four years ago and has invested \$4 million to fulfill the corporate objective to achieve zero discharge of hazardous wastes by December 1988. The first step was to stop using landfills for hazardous waste disposal.

"We stopped using them (landfills) in 1986 because it was not an environmentally sound practice," Beroiz said. "We were able to do this by reducing our hazardous waste by 90 percent at the source and recycling or destroying the rest through approved commercial disposal facilities."

New equipment on the processing line includes a self-contained copper plating machine and an air scrubber to capture potentially harmful emissions.



**Protecting the Environment.** Denny J. Beroiz, Manager of Environmental Resources at Pomona, explains to a film crew from the Environmental Protection Agency how the division's new copper plating machines will cut down the release of heavy metals. Pomona will be featured in the EPA's video production as an example of industry efforts to reduce toxic emissions.





Convair Employees Celebrate the Rollout of the First MD-11 Fuselage Sections

## Convair Delivers 1st MD-11 Fuselage Sections

Convair delivered the fuselage sections for the first MD-11 advanced trijet to McDonnell Douglas in Long Beach, Calif., on July 25th. Fuselage sections totaling nearly 147 feet were transported by barge from San Diego to Long Beach, where they will be mated with other sections for the first MD-11.

"This delivery marks a continuation of what has become a tradition here at Convair," said L. Roy Gilmour, Division Vice President and Aircraft Program Director. "Our long heritage as a major manufacturer of commercial aircraft structures is unsurpassed." He said Convair is expected to deliver about 200 fuselages for the MD-11

program.

August marks the 20th year of fuselage production at Convair, which has delivered fuselages for 386 DC-10 commercial jetliners and 60 U.S. Air Force KC-10 tanker cargo aircraft to Douglas. The last DC-10 fuselage, made in five sections, was delivered in May. The longer MD-11 fuselage has seven sections.

The initial flight of the fuel-efficient MD-11 is scheduled for early 1989, and the aircraft is expected to begin airline service in April 1990. McDonnell Douglas has 19 customers for the MD-11, with a total of 134 orders, options and reserves.

## Cessna Expands Australian Sales and Service

Cessna Aircraft Company has expanded its Citation business jet sales and service operations in Australia with the appointment of a regional sales manager and service organization.

B.M. (Monty) Maughan, an international aviation sales and marketing veteran, was named regional sales manager in Sydney, with responsibility for Citation sales throughout Australia and New Zealand. Maughan most recently was involved in the development of the Citation marketing

program in association with Rex Aviation Ltd. in Australia.

Cessna also has appointed Pacific Aviation (Australasia) Ltd. as its authorized Citation Service Station in Australia. The appointment includes Pacific Aviation technical facilities at Mascot and Bankstown Airports in Sydney; Eagle Farm Airport in Brisbane; Essendon Airport in Melbourne; and Wellington Airport in Wellington, New Zealand.



**F-16s Fly En Masse in Dutch Event.** The Royal Netherlands Air Force celebrated its 75th anniversary recently with activities including fly-bys by 75 Fighting Falcons. Part of the display is shown in top photo. A Dutch F-16 — with special markings to commemorate the 75th anniversary (bottom photo) — taxis after landing.

## Current & Comment

(Observations on news of interest to the company and the industry will appear regularly in this column.)

### Readers Respond

Professional pollsters would pale. Our June "How Do You Like *General Dynamics World*?" questionnaire drew 236 responses — woefully short of what expert opinion collectors consider an "acceptable" sample. (Actually, it represented less than one third of one percent since, these days, we distribute 76,000 copies.)

In spite of it all, what we did get was interesting. And well worth both sharing and acting upon. (Which we will do.)

Like "tough love" parents, respondents told us we were liked and needed. (89 percent call GDW "very good" or "good.") Then they proceeded to give us our whacks. For example (and we quote):

- "It's full of flub, fluff and propaganda."
- "Pabulum journalism."
- "Stories are all one-sided."
- "Content is boring!"
- "It serves the ego and image but not the reality of working at GD."
- "A waste!"
- "Too technical."
- "Stuff!"

Whew! Notwithstanding, some 87 percent scored the overall content acceptable — with more than 90 percent agreeing that stories were interesting, informative and well written. Many gave very high marks to GDW's increased color photography.

Such complimentary stats were tempered, however, with some less than subtle suggestions on improving content. For instance:

- "Not enough about the guy on the line!"
- "Tell the good stuff and the bad."
- "Too many Vice President promotions."
- "More about people, please!"
- "Get more political!"
- "Back-patting . . . awards . . . handshakes . . . YUK!"
- "Better divisional balance needed — how about the smaller sites?"
- "How about a Corporate Comic Strip?"

. . . and many more. In all, a lot of constructive thoughts and comments, many similar, some conflicting and some more irreverent than others. But all welcome.

We had asked about distribution. Was it satisfactory? Most (85 percent) said "yes," but enough said otherwise to flag us to glitches at some locations. Wrote one respondent: "If I don't pass them out, they could sit until the mailbox collapsed." Said another: "Distribution is OK — except in a heavy rain." And another: "There must be a better way!"

To the above (and to those who noted that "copies are locked in the mailroom"), we'll be working out your problems.

Finally, our questionnaire surfaced a few other messages that had clearly been waiting for a suitable moment. Such as "The corporate policy of not picturing bearded employees in *General Dynamics World* should be changed." (If such a policy ever existed, it certainly doesn't today and we welcome all photos of bearded newsmakers!)

Responding to "What do you like most? Least?", readers made it clear that "People" stories are popular — and some others are not. Look for improvements.

(We can't help the reader who offered "My foreman" as his greatest dislike.)

To all who took the time to return our questionnaire, your criticisms and compliments are greatly appreciated. While we may be unable to respond to every single suggestion, we certainly intend to address the likes and dislikes that were reflected by the majority.

We fully agree with the reader who asked for more personal stories, "because," she said, "nice people work at General Dynamics."

— Pete Connolly





**Soaring Scenes.** Fort Worth employee David Mockler's soaring craft, "The Pickle," is shown in flight at left. At right, Mockler opens the canopy after a flight. His plane, tail number 007, was formerly owned by astronaut Neil Armstrong, the first man to set foot on the moon.

## David R. Mockler Enjoys Flying Slow, Soaring with the Birds By Joe Stout

Fort Worth's David R. Mockler spends workdays in the place where Fighting Falcons are born. On weekends, he likes to soar with hawks and buzzards.

Mockler, 27, has been flying sailplanes for 14 years and has logged more than 2,500 hours of graceful, buoyant flight high in the sky where the only outside noise is the muffled rush of the wind.

The exhilarating and relaxing experience, he said, can only be appreciated first-hand and is very relaxing.

Soaring is both a sport and a science, requiring "total, 100 percent concentration," he said. "There's also a lot of meteorology involved, because almost everything you do depends on the weather."

Mockler has enjoyed extraordinary success in soaring competition. He recently won his fourth National Champion title for pilots of 1-26 Class sailplanes. In nine soaring competitions, he has finished either first or second eight times.

Sailplanes in the 1-26 Class, 24 feet long with a 40-foot wingspan, are virtually identical. The Schweizer company in New York built about 700 sailplanes from 1955 to 1978. Forty were entered in the recent national competition, which was sponsored by the Texas Soaring Association at its airport in Midlothian, Tex.

The 1-26 is made of fiberglass, aluminum and fabric and weighs about 400 pounds. It flies at speeds between 32 and 104 mph and can be aerobically maneuvered through loops, rolls and spins.

Mockler said his green and white aircraft, named "The Pickle," was owned by astronaut Neil Armstrong in the late 1960s when Armstrong lived in Houston. Armstrong reportedly raised the ire of NASA officials when he accidentally flew across the Mexican border — causing friction with U.S. Customs authorities — just weeks before he became the first man on the moon.

"A 1-26 flying competition is mostly pilot skill because of the similarity of all the sailplanes," Mockler said. The national championship lasted eight days, and each pilot flew a course of one to five turn-points each day to earn a possible 1,000 points per day, or a possible 8,000 total points. Mockler won with the high score, 7,762 points.

The sailplanes were pulled to an altitude of 2,000 feet by tow planes before release. The pilots then searched the skies for strong updrafts, or thermals, to carry their aircraft to higher altitudes.

"We look for areas of lift, which are small columns of rising air," Mockler said. "Cumulus clouds and certain terrain features are the tipoffs for these. The trick is to use only the very best lift. To be that selective, sometimes you have to really push, trading your altitude for distance until

you find a good thermal."

With experience, a sailplane pilot develops a "feel" for the air that helps him find the strongest currents, Mockler said.

"This lets you do what the soaring birds do," he said. "It's like a sixth sense that tells you, 'The lift must be over that way.'"

Mockler said he spends a lot of time "flying in formation with hawks and buzzards."

The typical flight in the recent contest, with the assigned turn-points, was three to four hours long and reached altitudes of 8,000 to 9,000 feet, Mockler said. "It's pretty grueling. You're out in the sun all day, you're working really hard and you have a lot of water loss."

Noncompetitive sailplane flight is limited only by the pilot's endurance and can extend eight hours or more.

Sailplane pilots are required to hold a license similar to that of pilots of single-engine private aircraft.

Mockler, who was born in St. Louis, has lived in the Fort Worth-Dallas area most of his life and has been with General Dynamics since 1986. He works in accounting in Facilities Planning.

When he isn't flying sailplanes, he likes to spend the weekend at the lake with his boat. "When the wind's blowing too hard for good soaring, I go sailing," he said.



**Another First on the F-16 Line.** Factory managers at Fort Worth placed flags and signs representing Singapore, Thailand, South Korea, the United States and Israel in the F-16 final assembly area recently to identify aircraft being produced side by side for the five countries. Fort Worth has had as many as 25 aircraft types in work, including F-16A/B and F-16C/D models for various countries, but this was the first time that six different versions have come through final assembly together. The group includes both an F-16A and F-16B for the Royal Thai Air Force.

## Electric Boat Boosts Junior Achievement Business Program

Junior Achievement's Project Business Program got a boost from Electric Boat when division employees acted as consultants, teaching basic economic principles to students in area junior high schools.

Susan M. Strader, Junior Achievement Chairman at Electric Boat, said Project Business is providing employees with a strong sense of community involvement. "The consultants feel very good about bringing their perspectives from the workplace into the classroom," she said. "They feel they can contribute to the children's education and the students respond well to the challenge of working with the consultants on a special project."

Employees, participating as professional representatives, teach one class a week for nine weeks and may teach together as a team. Once in the program, they receive fully developed materials, designed specifically for eighth- and ninth-grade students.

## Innovative Method of Rejuvenating Chemicals Cuts Hazardous Waste

Fort Worth recently began using an innovative method of rejuvenating material-processing chemicals that can reduce the amount of hazardous waste derived from spent chemical baths by as much as 90 percent.

The system involves electrolysis of solutions to remove metals and other contaminants left by the chemical treatment of aircraft parts in production. By reducing the volume of waste, it supports the company's Environmental Resources Management (ERM) goal of zero discharge of hazardous waste materials.

The method may also greatly reduce costs associated with offsite waste disposal, while reducing the need to replenish processing baths with new chemicals by prolonging the useful life of solutions, said John H. Hooper, Senior Chemist in the division's Materials and Process Control Department.

The concept is being applied for the first time to clean a sulfuric acid solution called etchant. Aluminum components of F-16 vertical and horizontal stabilizers are processed in the etchant to prepare their surfaces for bonding with composite tail skins.

The etchant is contained in two large dip tanks in the F-16 factory. Spent etchant previously had to be removed periodically, producing about 600 gallons of chemical waste for disposal by an offsite firm.

"By cleaning the etchant with the new system and removing the contaminants in concentrated form, the volume of waste has been reduced to about 60 gallons," Hooper said.

Hooper said he began researching electrolytic methods for regenerating metal finishing solutions about five years ago. He designed and built a prototype system for the

regeneration of chromic anodizing solutions, which Fort Worth uses in great quantity in the anticorrosion treatment of aluminum parts.

"The prototype was unsuccessful, but it gave us useful experience that indirectly led to development of the system for cleaning etchant," Hooper said.

Fort Worth is developing specifications for a system to be used with the anodizing tanks. The system could be very beneficial in terms of environmental resources management and cost reduction, he said.

Electrolytic regeneration employs a "closed loop" system that continuously cleans the solution and returns it to the chemical bath without interrupting production, Hooper said.



## Electronics Division and Tadiran to Produce Radios at Tallahassee, Fla.

The company will start production of Single Channel Ground and Airborne Radio Systems (SINGARS) for the U.S. Army in late 1989 at new facilities in Tallahassee, Fla.

The SINGARS contract was signed July 15th at Fort Monmouth, N.J.

The team of Electronics Division and Tadiran, an Israeli-based company, was selected recently by the U.S. Army Communications-Electronics Command as the second-source producer of the advanced radios. According to the Army, the General Dynamics/Tadiran team will compete for production of 400,000 radios with a potential value of about \$5-6 billion over the next 10 to 15 years.

The \$22.1 million SINGARS contract calls for 550 production units. A total of 150 will be used for operational and first-article testing beginning in 1990. The other 400 production units are to be delivered in 1991.

The contract includes three options for purchase of additional radios. The first calls for 1,725 production units and may be exercised by March 1991. The second option calls for up to 10,375 production units and may be exercised by January 1992. The third option calls for up to 16,500 units and may be exercised by November 1992. If all three options are exercised, the contract will provide 150 test units and 29,000 production units with a total value of \$191.3 million.

"This represents a significant new business base for General Dynamics in the extremely competitive defense electronics arena," said Melville R. Barlow, Vice President and Electronics General Manager. "We have assembled a strong professional team dedicated to capturing a major share of the overall SINGARS business on the order of \$3-4 billion over the long term."

"It is clear to General Dynamics that second sourcing of major defense programs is here to stay," Barlow said. "We believe SINGARS is an appropriate second-source program because of the high-volume production anticipated. Our goal is to incorporate improved reliability into this new family of combat net radios."

The Electronics Division plans to open a temporary office in Tallahassee. A cadre of technicians will be recruited and trained locally to begin pilot production of the first 550 radios starting late next year.

Interior design work is under way on General Dynamics' 90,000-square-foot facility in Tallahassee's Commonwealth Business Park. Occupancy of office areas will begin in March 1989. Tadiran will occupy an 80,000-square-foot building in Innovation Park, another local business development.



**New Office Complex Recognized.** Two different engineering groups cited the recently completed Land Systems Central Office Complex at Sterling Heights, Mich., as an example of engineering excellence and an outstanding construction project. The Consulting Engineers Council of Michigan recognized the engineering excellence of the Central Office Complex with its 1988 Honorable Conception Award. The new complex was judged on meeting and exceeding owner's needs; originality, uniqueness and new application of existing techniques; social and economic considerations; technical value to the engineering profession; and complexity. The Engineering Society of Detroit cited the office complex as an outstanding construction project using as criteria land use and environmental considerations; appropriateness of materials; innovative construction materials; quality of overall design; unique engineering systems features; degree of energy consciousness; and end use and social and economic impact on Michigan.

## Supervisors Honored For Notable Support Of Guard/Reserve

John M. Reeves, Fort Worth's Manager of Special Projects Security, and Buddy J. Wright, the division's Chief of Special Projects Security, were honored recently for providing outstanding support to employees in their area who have armed forces reserve duties.

Lt. Col. William W. Childers, Commander of the 607th Military Police Battalion of the U.S. Army Reserve, presented Employer Support of the Guard and Reserve appreciation certificates to Reeves and Wright in a brief ceremony at the division. They were nominated for the award by Jerry D. McGee, a Special Projects Security Analyst who also serves as Command Sergeant Major of the local unit.

In presenting the award, Colonel Childers recognized the two supervisors for cooperating with McGee as he performs reserve duties that, because of his position, sometimes require more days away from his company job than are usually required of a reservist.

Wright serves as a reservist also, with the rank of lieutenant colonel at the 90th Army Reserve Command Headquarters in San Antonio, Tex. "I am familiar with the problems associated with juggling a civilian and part-time military career," Wright said. "We try to be supportive because the training received by the part-time soldiers often enhances their ability to perform for General Dynamics and saves us training money, as well as helping to give the employee valuable experience," he said.

Hundreds of General Dynamics employees from facilities throughout the nation serve in guard and reserve units.

## New Training Program for Convair Engineers Proving Successful By Julie C. Andrews

Family and friends gathered at General Dynamics Missile Park in San Diego recently to honor 89 graduates of a new Convair program called "Strengthening Our Engineering Leaders (SOEL)."

The program has received overwhelmingly positive feedback from the first class of graduates and has garnered an academic stamp of approval with master's accreditation from San Diego State University. Convair's top engineering management sees the program as essential training for current management people and those principal and lead engineers who are potential managers.

At the graduation ceremony, Raymond F. Beuligmann, former Division Vice President - Research and Engineering, said, "In today's competitive environment, the test of good management is the ability to mobilize the combined brainpower of all employees. In designing the program, we listened to what our engineers were telling us they needed."

Beuligmann was joined in presenting the graduation certificates by J. W. Vega, current Division Vice President-Research and Engineering. Beuligmann and his staff began planning the program in 1986 at the time employee survey results showed that engineers wanted more training. Later Beuligmann was appointed Modular Standoff Weapon Program Director but maintained an interest in the pilot SOEL undertaking.

The six-month program was designed in 17 modules, totalling 34 classes held twice a week after work hours. One half of the program looked in depth at Convair systems including new business development; the interfaces among engineering, operations and quality assurance;

transition to production; scheduling engineering tasks; cost and schedule controls; subcontract management; and understanding the engineering process from predesign through decommissioning.

The other half of the program covered human relations topics including team building, directing and coaching, management and labor relations, communication skills, time and stress management, problem-solving and staffing selections.

Attendance was voluntary but strongly encouraged by engineering management. All functional and program departments of Convair were represented by the 52 instructors, who provided the expertise of the division in each subject area. Space Systems also provided two instructors.

William C. Finch, Senior Engineering Specialist in Systems Integration, confessed to a somewhat negative point of view when he started SOEL, thinking it was going to be just another management training program.

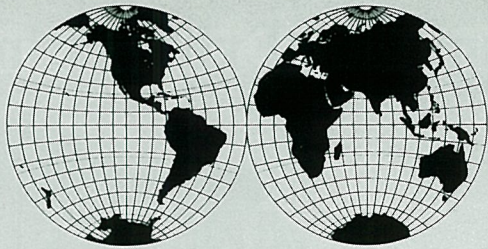
"I changed my mind about the fifth module. I think it's probably one of the best courses of its kind I've taken, partly due to instructors who are doing what they're teaching and also due to the group dynamics of the people who were in the class. The program shows the flow of information is working in the right direction."

Carman L. Dawson, Engineering Business Coordinator and SOEL Program Director, said the second SOEL program will begin in August with a few changes based on feedback from the first class.



**Behind Convair's SOEL Program.** Supporting the engineering training program are (seated) Raymond F. Beuligmann, Division Vice President and Program Director-Modular Standoff Weapon; (standing, left to right) J. W. Vega, Division Vice President-Research and Engineering; Lawrence M. Nelson, Director-Engineering Business Systems; and Carman L. Dawson, Engineering Business Coordinator.





## Around the World

**CHQ:** James H. Perkins joined as Project Development Manager-DIO... Orval P. Sweeney as Technology & Analysis Staff Engineer... Myron R. Holtzman as Communications Specialist... Samuel D. Wyman III as DIO Program Director-Conventional Defense Initiative... Robert J. Rannebarger transferred from Land Systems and was promoted to Corporate Manager Office Services... Keith R. Rivers transferred from Land Systems and was promoted to Internal Audit Chief... Suzanne L. Jarvis was promoted to Corporate Benefits Specialist... Donald A. Barr to Internal Audit Chief... Dana P. Dorsey and Candace M. Goepfert to Supervising Senior Auditor... Jerome L. Nelson to Supervising Senior Information Systems Auditor... Sandra F. Hiza to Accounting Operations Analyst.

**Fort Worth:** Jerry P. Anderson was promoted to Superintendent... Malcolm C. Boisselier, Kevin S. Hendricks and Monty Suttle to Program Specialist... Jeffrey S. Bowman to Buyer... Oscar W. Brown, Roger W. Butler, Mark B. Cayce, James B. Duncan, Kathy E. Enochs and Bobbye J. Traylor to Material Planning Supervisor... John A. Brunet, Ramon E. Cartier and John R. Sampish to Purchasing Agent... Hugh N. Cameron, David S. Cloud and Robert E. McClendon to Material Supervisor... Billy G. Cole to Project Engineer... Leslie P. Couch and Charles F. Howell to Procurement Chief... John C. Dickey to Contract Representative... Billy R. Dinger to Logistics Manager... Kenneth L. Dixon and Ervin R. Hicks to Contracts Administration Manager... Jackie D. Fanning, Ricky L. Head, Alvin L. Ivy, Lowell W. Phillips and Philip W. Watson to Material Planning Chief... Martin W. Foster to Senior Quality Control Field Engineer... Bobby L. Fry to Business Manager... Robert D. Garrett, Charles Medlock Jr. and Richard W. Thornton to Project Manager... Victor V. Hajek to Material Program Administrator... Martha A. Haney to Property Management Analyst... Robert G. Henry to Material Cost Supervisor... William H. Hilliard to Estimating Chief... Vance R. Hodge to Senior Property Management Analyst... Ronald J. Ingram to Material Control Manager... John O. Inkelaar to Contracted Construction and Work Manager... Larry J. Langston and Shawn P. Mulvaney to Engineering Chief... Cy T. Leonhardt to Information Systems Specialist... Ceth Lewis to Quality Assurance Engineer... Dorr Lobrecht Jr. to Engineering Project Manager... John B. Mahoney to Logistics Group Engineer... Nancy G. Mathisen to Security Analyst... William J. Mechura Jr. to Plant Services Chief... Allen C. Vyce to Senior Manufacturing Engineering Specialist... Gregory L. Wyckoff to Senior Buyer.

**Convair:** Philip D. Desjardins and Paul J. Townsend were promoted to Engineering Manager... Jack L. Moceri to Configuration and Data Management Manager... Gerald R. Young to Assistant General Counsel... George S. Kendall to Group Engineer... James P. Silva Sr. to Senior Project Engineer... Rolland R. Nelsen to Drafting Chief... Nicholas A. Ponomareff to Program Engineering Chief... David K. Shutts to Engineering Chief... Philip C. West to Configuration Management Supervisor... Roy B. Ziemann to Configuration Management Chief.

**Electronics:** Gene C. Ragan was appointed to Contracts Director.

**Space Systems:** Robert E. Dupuis was appointed to Commercial Launch Services Business Management Director... Robert J. Reynolds was promoted to Chief Project Engineer... Jeffrey H. Pate to Manufacturing General Supervisor.

**Electric Boat:** John P. Casey was promoted to Ships Management Manager... James H. Healy to Quality Planning & Defect Prevention Manager... Raymond Thiel to Engineering Chief... Robert H. Nardone to Salary Administration Chief... Harrison H. Solt to Quality Chief... Tod W. Schaefer to Master Planning Chief... James F. Bowersett and Ludwig Fuisting to Engineering Supervisor... Peggy A. Laliberte to Trade Planning Supervisor... Michael R. Perry and David E. Wishart to Electronic Test Foreman... Bryan J. Gullickson to Foreman... At Idaho, Brett T. Chenier to General Foreman... At Kesselring, Paul T. Dagle to Engineering Chief... Michael J. Kelly to RADCON Operations Superintendent... William B. Traber to Assistant Superintendent... Charles F. Chase to General Foreman... Ervin G. Doubleday to Inspection Foreman... Gary R. Cozart to Foreman... At Avenel, James A. Ferri to Safety, Security & Environmental Resource Management Chief... At Quonset Point, Richard J. Morel to Senior Material Planning Supervisor... Harold Decoste, Daniel Petrozzi and Gerald Roberts to Senior Packaging Administrator.

**Land Systems:** Edward M. Turich Jr. was promoted to Quality Assurance Planning and Administration Manager... Harold Nolan to Training Chief... Rick J. Wyrembelski to Senior Engineer... Thomas B. Vernier to Senior Buyer... Andrew Nichols to Business Planning Manager... Supriya Sengupta and Joseph G. Cymbalski to Financial Analysis Chief... John L. Zaprawa to Plant Engineering Supervisor... Lance L. Auyer to Engineer... Richard B. Kaelin to Manufacturing-Engineering LATP Chief... Stephen D. Warner to Engineering Supervisor... Linda I. Knoll to Program Management Chief.

**Pomona:** Curtis A. Maddock was appointed to Navajo Facility Director... Sylvia A. Henderson was promoted to Design Specialist... John F. Herold and William H. Scannel to Project Engineer... Steven W. Mayfield to Senior Quality Assurance Specialist... Raymond W. Naylor to Engineering Manager... Jeffrey A. Taylor to Section Head.

**Data Systems:** At Western Center, Richard W. Jennings was promoted to CAD/CAM Chief... Morgan R. Hinkle to Engineering Software Supervisor... Judith Wells to Business Systems Development Supervisor... Edmond D. Murphy, Stephen G. Rasmussen and Frank R. Santore to Project Engineer Supervisor... At Central Center, Donald W. Brosious, Scott Haberstroh and Dorothy Hensel to Engineering Software Supervisor... Douglas A. Ross to Operations Services Chief... At Eastern Center, Kevin J. LaBonty to Business Systems Development Supervisor.

**GDSC:** Gary K. Nelson was appointed Peace Vector Programs Director... Hans H. Ingold was promoted to Program Administration Supervisor... William P. Conley to Aircraft Maintenance Group Leader... Russell D. Erps to Senior Engineering Assistant... Laurie C. Miller to Accounting Analyst... Stephen D. Baker to Senior Aircraft Specialist... Randy K. Hoffland to Operations & Maintenance Site Supervisor.

## Fort Worth Sponsors a Local Career Day In Its Youth Welfare and Education Program

Fort Worth continued the company's community support efforts in the areas of youth welfare and education by sponsoring a Career Day recently at Metro Opportunity School in the local school district.

The division is involved with Metro through the Fort Worth Independent School District's Adopt-A-School program. Metro is an alternative campus offering an education to students who are not successful in a regular school setting.

Several Fort Worth employees participated in the Career Day by explaining the importance of education and the types of careers that are available at the division. Michael L. Hester and Elizabeth Polak, of the Employment Section, gave the students tips on filling out a job

application. They also explained some dos and don'ts for job applicants by performing a mock employment interview.

Other participants were Michael R. Greenfeder, Construction/Maintenance General Foreman, Michael E. Wadsworth, Transportation Foreman, Roy V. Cushman, a graphic artist, Ray E. Carroll of Data Systems' Central Center and Art F. Schwarm, a production specialist with knowledge of aircraft painting careers.

Fort Worth has also assisted Metro by providing tutors and mentors, writing projects, small gifts (such as F-16 tie tacs) to recognize student achievement and other types of support, said Norman B. Robbins, Community Relations Manager.

## Pilots Logging 1,000 Flight Hours in F-16 Reach 500 Mark

Capt. Michael "Bags" Wilson, of the U.S. Air Force's 52nd Tactical Fighter Wing at Spangdahlem Air Base, West Germany, has become the 500th pilot to log 1,000 flight hours in the F-16 Fighting Falcon.

Captain Wilson achieved his 1,000th F-16 flight hour during a recent F-16C low level training mission over West Germany.

He received F-16 flight training at MacDill AFB, Fla., in 1983 and has flown the aircraft during assignments at Kunsan AB, South Korea, and Shaw AFB, S.C.

"Like other F-16 pilots, I love the airplane," Captain Wilson said. "It's easy to fly and deadly when employed. I don't think there is a man alive who has a more fulfilling job than mine — protecting and defending our country in the world's finest fighter."

Captain Wilson said he toured the Fort Worth production facility and was impressed by the scope and complexity of the operation. "Thanks to the folks on the 'line' at General Dynamics for 1,000 accident-free hours," he said.

The first pilot to log 1,000 hours in the F-16 was then-Lt. Col. Dean Stickell in mid-1981.

The worldwide F-16 fleet surpassed the 1-million flight hour mark in January 1986 and is expected to reach the 2-million flight hour mark this year.

Through June, 2,131 F-16s had been delivered to 14 air forces. Seventeen air forces have ordered more than 3,000 F-16s, and plans indicate that as many as 5,000 Fighting Falcons may be built by the end of the century.

Pilots say the excellent readiness record of the F-16 has been an important factor in allowing them to accumulate high flight hour totals. The USAF's F-16C fleet has consistently reported more than 90 percent readiness to fly and fight.



**Five Hundredth 1,000-Hour Pilot.** Capt. Mike "Bags" Wilson, the 500th pilot to log 1,000 flight hours in the F-16, with the Fighting Falcon he flies at Spangdahlem Air Base, West Germany. Captain Wilson flies the F-16C in the "killer" role of an F-4G/F-16 Wild Weasel hunter/killer team. The Wild Weasel mission in combat is suppression of radar-guided surface-to-air missile sites.

### Savings and Stock Investment Plans

	Annual Rate of Return for the 12 Month Period Ending:		
	June 1986	June 1987	June 1988
<b>Salaried</b>			
Government Bonds	12.9%	6.4%	7.4%
Diversified Portfolio	37.6%	27.6%	(6.2)%
Fixed Income	12.2%	11.8%	11.0%
<b>Hourly</b>			
Government Bonds	12.2%	6.6%	7.7%
Diversified Portfolio	38.7%	28.9%	(6.4)%
Fixed Income	12.1%	11.8%	10.9%
<b>GD Stock Closing Price</b>	\$76.50	\$66.75	\$53.00
( ) Negative number			



## Martha Josten Found Life Aboard a Submarine Exhilarating By Myron R. Holtzman

The conditions were cramped and there wasn't much for her to do in her spare time. However, Martha Josten was where she wanted to be.

Josten, an engineer at Electric Boat, was in a strange environment in which few women had been permitted. She was aboard USS *Providence* (SSN 719), a submarine undergoing sea trials, monitoring a project that required her engineering expertise.

"It's an experience you can't forget," she said. "It's exhilarating to see the crew in action, interacting with equipment that you normally see only in the lab."

This previously was the only way Josten had seen the equipment she uses in her job ashore.

Because the U.S. Navy had traditionally barred women from sailing on submarines, Josten's initial efforts to board a ship had met opposition, and her repeated requests for a sea trials assignment were refused.

Josten persisted, saying she only wanted to do her duties as an engineer and run her own tests. From a professional perspective, she maintained, an engineer, regardless of sex, should be allowed to participate.

Josten's case was not unique. In 1980, a sex discrimination suit was brought against the Navy by Pamela Celli, a technician at the Portsmouth Naval Shipyard. The Navy's argument was that there were inherent difficulties in segregating a woman from male crew members in the confined quarters of a submarine.

In June 1987, however, Navy Secretary James H. Webb Jr. allowed Celli to go to sea and stipulated that women be given full opportunity in the future to go on other non-operational, short-term sea trials.

The decision cleared the way for Josten, who has been at Electric Boat since 1984.

"It didn't start out as a women's issue when I initiated my request," said Josten, who became the first woman in three decades at the division to participate in submarine sea trials.

"I felt it was something I wanted to do for myself because it was my job, but it turned out that I helped break ground for other women on this issue."

Josten already has made a second voyage, aboard USS *San Juan* in late June. She wasn't the only female aboard, she said. Another engineer from the nearby Naval Underwater Sound Center in New London was aboard to conduct sonar tests.



Martha Josten in Front of the USS *San Juan*, the Navy's Most Improved Fast-Attack Submarine

Josten, known to her colleagues as Marty, said the only obstacle she encountered aboard ship, aside from the curious glances at first, was using a washroom, called a "head" in the Navy. A corpsman solved the problem by giving her a sign to post reading, "Woman in Head."

Josten said at first she was nervous about the reception she would receive, having heard rumors that many of those on board didn't want a woman to invade their privacy.

"But they made me feel comfortable," she said. "I didn't want any special considerations, but in a situation like that, it's kind of hard to avoid it. They wanted to make me happy."

That included the opportunity to tour the ship, listen to the sounds of sea creatures in a visit to the sonar room, get

a "driving" lesson from one of the sailors and watch a sunrise from the bridge.

However, while she believes many barriers have fallen for female engineers since she graduated from Purdue University in 1984, Josten said she occasionally has to overcome the perception that engineering is a man's field.

But Josten has hurdled those obstacles at Electric Boat and is a well-respected member of the engineering team. She said her brief submarine voyages have been educational not only for her but also for the crewmen involved.

"I received a lot of good feedback from the crew and then from management," she said. "People learned to respect me and trust what I was saying."

## Retired Convair Employees Restore PBY for San Diego Museum By Julie C. Andrews

She was minus her wings and on dry ground, but the 45-year-old PBY-5A Catalina flying boat made quite a splash before the San Diego news media on Aug. 3rd. A rollout for the press culminated a 19-month restoration project for about 75 retired Convair employees, many of whom helped build PBYs in the early days of their careers. It was also the start of the last journey for the famous amphibian.

Several days later, the PBY was towed through downtown San Diego to the Aerospace Museum, its outer wing panels following on flatbed trucks. There, the Convair alumni attached the wings and the PBY made its final "flight" at the end of a 300-foot crane that lifted it over the museum walls and into the center courtyard.

"General Dynamics is very proud to be part of San

Diego aviation history and to support the wonderful work of our retirees in making this project happen," said John E. McSweeney, Vice President and Convair General Manager, at the press event. In addition to providing the space for the PBY project, Convair donated \$50,000 to the museum for the display.

The retirees and other Convair officials were honored at a museum reception Aug. 10th when the San Diego community got its first look at the newly installed PBY. Edwin O. McKellar Jr., Director of the Aerospace Museum, called it the most famous airplane Consolidated ever built.

Originally, the PBY was to be maintained in flight condition at the museum's hangar. When the museum decided to put the PBY on static display, the retirees

returned the airplane to its original military configuration and designed and fabricated the saddle and fitting for mounting the aircraft on columns. They rebuilt the PBY's nose to house two 30-caliber machine guns. The sea-blue Navy paint job was done to the original 1943 drawing.

The retirees were uniquely qualified for the project. Nearly half of them worked at Consolidated during PBY production. Some also flew PBYs.

Joe Miller, who served as the restoration coordinator, spent 38 years with the company and worked on every Convair aircraft from the B-24 Liberator bomber to the Model 990 airliner. He recruited many of the restoration team members whose careers with Consolidated (subsequently General Dynamics Convair) represented a wealth of experience in production, engineering, management, inspection and even technical illustration. Many had particular expertise that was useful for the one-of-a-kind tasks encountered in the refurbishing.

This restored PBY was delivered to the U.S. Navy on Dec. 31, 1943. Its first assignment was to Johnston Island in the Pacific from which it patrolled the Gilbert and Marshall islands. Dave Leslie, a retired naval aviator, flew this PBY in 1944 and has his log book to prove it. How did it fly? "Low and slow," Leslie said. Leslie, who also flew the Consolidated PB4Y Privateer, said that Consolidated made more outstanding airplanes than any other company. He heard about the restoration project and signed on about a year ago.

Wayne Heztler, a radioman on PBYs during World War II, said the PBY was comfortable and that safety was never a worry. "It was very reliable," he said. "The after-blower was like a big bay window. We had bunks and even a two-burner stove to prepare meals."

Bill Boehmler, who also flew PBYs, said, "The airplane was rugged enough to make open sea landings to pick up a downed pilot without popping a rivet, although sometimes we had some sore ribs."

Catalinas were often used in rescue operations but their primary roles were as patrol planes and bombers. It also saw service as a cargo plane and personnel carrier. Consolidated workers had built 2,393 Catalinas by the end of World War II. During the war, more PBYs were built than any other flying boat.



PBY-5A Installed in San Diego Aerospace Museum



## Company May Team With Italian Firm In Space Activities

General Dynamics Corporation and Aeritalia have signed a Memorandum of Understanding (MOU) that could lead to a teaming arrangement in a number of international commercial launch activities.

The agreement between General Dynamics' San Diego-based Commercial Launch Services and Aeritalia's Space Group, Torino, Italy, follows more than a year of discussions between the two companies.

The MOU identifies four separate areas of potential activity:

- A feasibility study of the use of the General Dynamics Atlas launch vehicle for Aeritalia's Italian Research Interim Stage.
- The selection of Aeritalia as a potential subcontractor to General Dynamics for Atlas production.
- A feasibility study of the market and desirability of carrying secondary payloads aboard Atlas.
- A cooperative effort in the development and production of Space Station re-supply and logistics/modules.

Dr. Alan M. Lovelace, Vice President and General Manager of Space Systems, said the MOU represents the company's "continuing interest in establishing long-term agreements with experienced, technically qualified and cost-competitive firms such as Aeritalia."

## Company-Sponsored Community Projects Receive Recognition

Two company-sponsored community action projects have earned recognition for General Dynamics from the President's Citation Program for Private Initiatives.

The President's Citation Program, established by the White House Office of Private Sector Initiatives, awarded General Dynamics the right to fly the program's red, white and blue "C-Flag" because of the company's "Please Vote" and "Great Leaders of the 20th Century" projects. The flag bears the motto "We Can - We Care" and recognizes outstanding contributions to volunteerism and community action.

General Dynamics' "Please Vote" program aims at increasing voter turnout by publishing and broadcasting ads and distributing voting and registration materials to high schools. The company granted \$75,000 to the Vote America Foundation to fund the development and distribution of these materials to all high school social studies classes.

The "Great Leaders" series consisted of four 90-minute Public Broadcasting System specials on Winston Churchill, Dwight Eisenhower, Lyndon Johnson and Pope John XXIII underwritten by General Dynamics. The company used print ads and mailings to offer study materials and videotapes of all four programs free to all U.S. high schools. More than 25,000 schools responded with requests for the tapes and materials.

## Fighting Falcon Unit Excels in Exercise

The F-16 Fighting Falcon excelled again recently during the U.S. Air Force's 17th Tactical Fighter Squadron's Coronet Warrior II operations exercise at Shaw AFB, S.C.

The 30-day exercise required the 363rd Tactical Fighter Wing unit to fly fully mission capable (FMC) aircraft for 30 days, including seven days at high-sortie "surge" rates.

The tactical air-to-ground missions included ordnance delivery, use of electronic warfare systems and in-flight refueling. The average sortie lasted more than an hour and 40 minutes.



F-16 Carries AIM-7 Missiles in Flutter Test

## First Launches Set for AIM-7 Sparrow Missiles In Program to Increase F-16's Flexibility

By Joe Stout

Fort Worth has reached significant milestones in its programs to add AIM-7 "Sparrow" beyond-visual-range missile capability to the F-16 Fighting Falcon. The AIM-7 is an all-weather, all-aspect, medium range radar missile that will enhance the effectiveness of F-16s in the air-to-air role.

Separate projects are making the AIM-7 option available for F-16A/B and F-16C/D aircraft. Work has been proceeding at Fort Worth, at associate contractor facilities and at Edwards AFB, Calif.

The first AIM-7 launch from an F-16A will occur soon at Edwards AFB. The first guided launch will occur later in the fall at the U.S. Navy's missile test range at Point Mugu, Calif.

The incorporation of AIM-7 is a logical step in the F-16's evolution as an all-weather, day-or-night fighter. The F-16 was introduced as the day-only "low" element in the U.S. Air Force's high/low fighter mix in 1979. AIM-7 will provide the aircraft its first operational beyond-visual-range missile capability.

The introduction of AIM-7 capability is especially important for international air forces that operate the F-16 now or will add it to their inventories in the future.

The Sparrow option will complement the F-16's capability to carry and launch the AIM-120 Advanced Medium Range Air-to-Air Missile.

AIM-7 capability is being added to U.S. F-16As and Bs in the Air Defense Fighter Program. Twelve Air National Guard and active USAF interceptor squadrons will be equipped with 270 F-16s missionized for air defense of the

continental United States. The first AIM-7-capable Air Defense F-16 is scheduled to be delivered in February 1989.

AIM-7 store certification flight tests have been under way in recent months with F-16A/B aircraft at Edwards.

Major AIM-7 related aircraft modifications in the Air Defense Fighter program have included addition of a Continuous Wave Illuminator for missile guidance, antennas, wiring provisions and an Enhanced Missile Remote Interface Unit. The Continuous Wave Illuminator is a new, separate unit of the F-16A/B's APG-66 fire control radar.

In the F-16C/D program, AIM-7 capability is being developed for international aircraft in an industry-sponsored effort. Associate contractors are Westinghouse Electric Corporation, Raytheon and Dynamic Controls. In the F-16C/D, the target is illuminated for missile guidance with Pulse Doppler Illumination (PDILL) provided by the Westinghouse APG-68 radar. The PDILL mode includes electronic counter-countermeasures capability.

The first Sparrow launch from an F-16C/D is scheduled for early next year. The F-16C/D AIM-7 tests will be conducted at Fort Worth and Edwards.

F-16 AIM-7 integration was first analyzed and demonstrated in the late 1970s before the beginning of production Fighting Falcon deliveries. AIM-7 and Skyflash missiles were launched from a YF-16 prototype aircraft.

The integration of AIM-7 capability adds new options and flexibility for air forces that operate the F-16 around the world.

## Navy Awards Pomona \$119.6 Million Contract For 100 Percent of FY '88 Phalanx Production

The U.S. Navy announced Sept. 2nd that Pomona was awarded a \$119.6 million contract for 100 percent of the FY '88 production of the Block I Phalanx Close-in Weapon System. The work will be completed over the next three years for the Naval Sea Systems Command. This is the first Phalanx contract in which Pomona competed for production.

The contract calls for Pomona to produce 36 Block I units and 35 ordnance alteration kits and provides options for five additional kits. These kits convert earlier Phalanx models to Block I capability. The award combines purchases for the U.S. Navy and the governments of Japan, Greece, Taiwan and the United Kingdom under the Foreign Military Sales program.

Block I Phalanx incorporates major performance upgrades to the weapon system, including increased search volume and enhanced fire control system, increased ammunition magazine, increased fire power and increased reliability and maintainability.

These improvements, developed at Pomona, give Phalanx high-elevation coverage against high-altitude

diving targets while maintaining low-altitude, sea-skimmer coverage. Its acceptance by the Navy follows a successful at-sea testing program, which validated its improved capabilities.

Pomona began production of its new Block I version in January 1986. In early August, the first four systems were delivered to the U.S. Navy for installation aboard the USS *Wisconsin*. The division has firm orders to produce 166 Phalanx Block I models through February 1991.

Phalanx, the U.S. Navy's highly effective close-in defense against airborne threats, was designed by General Dynamics and has been manufactured at Pomona since 1979. Pomona has delivered more than 550 Phalanx systems to the United States and allied navies.

Capable of operating in an all-weather, close-in environment, Phalanx automatically carries out search detection, target threat evaluation, tracking and firing. The system's unique defensive capability is based on closed-loop spotting, a breakthrough in radar technology created by Pomona engineers.



# Two Thousand F-16s Surpass Two Million Hours Worldwide

The worldwide F-16 fleet has surpassed two million flight hours in operation with the U.S. Air Force, U.S. Navy and the air forces of 12 other nations.

This F-16 program milestone was achieved nine years after the first operational Fighting Falcon unit was activated at Hill Air Force Base, Utah, in January 1979.

Today, nearly 2,000 F-16s are flown from 46 bases in 15 nations. Two U.S. Air Force Reserve wings and nine Air National Guard units also fly the aircraft in defense of the United States. More than 500 pilots have each exceeded 1,000 flying hours in the F-16, and five have reached the 2,000 flight-hour mark.

Allied air forces operating F-16s include those of Belgium, Denmark, the Netherlands, Norway, Israel, Egypt, Pakistan, Venezuela, Korea, Turkey, Thailand and Singapore. Greece, Indonesia and Bahrain have also ordered F-16s. Japan has selected an F-16 derivative for its FS-X program.



**VECP Appreciation.** W.B. "Zim" Zimmerman (left), Fort Worth's Vice President-Logistics and Support, presents award to employee Roger A. Nelson in recognition of Nelson's idea that led to a \$25.4 million F-16 program Value Engineering Change Proposal (VECP).

## Fort Worth Receives USAF Incentive Fee

The U.S. Air Force recently approved a Fort Worth-submitted Value Engineering Change Proposal (VECP) that will save the Air Force more than \$25.4 million over the life of the F-16 program. Fort Worth was awarded a \$941,058 incentive fee as its share of the savings, and Roger A. Nelson, the Logistics Group Engineer who conceived the VECP, received a cash Employee Suggestion award.

"This is an example of a win-win-win cost reduction initiative," said John D. Jackson, Fort Worth's Manager of Cost Reduction Programs. "All of us won as taxpayers."

Nelson's idea proposed a more cost-effective method of listing wiring data in technical publications for F-16C versions. Instead of listing the serial numbers of affected aircraft models separately throughout the manuals, he suggested the addition of central tables providing lists of aircraft effectivity.

The F-16C Technical Order set includes more than 12,000 pages in 10 volumes. Nelson's idea will significantly reduce the number of pages, Jackson said.

"This is an excellent example of how an individual employee can make a major impact in the company's drive to become more cost-competitive," Jackson said.

# Current & Comment

*(Observations on news of interest to the company and the industry will appear regularly in this column.)*

## Foreign Views

**FARNBOROUGH, England** — Nearly 50 years after British Spitfires and German Messerschmitts dueled to the death in these English skies, Soviet and American combat aircraft contended earlier this month for best-of-show aerobatic honors before thousands of spectators from all over the world.

All of the talk at this 29th Farnborough Air Show (the first was staged just three years after the end of WWII) was not, however, about the comparative performances of the MiG-29 Fulcrum and the F-16 Fighting Falcon.

With only a few weeks remaining before America's Presidential sweepstakes, the relative prospects of the two campaigning candidates was a popular topic of discussion.

How is the "Great Race" viewed overseas? We asked professional journalists from several foreign countries. These were their (unedited) replies:

**FRANCE:** "I think the perception is that Bush is weak — and Dukakis is a new-generation Jack Kennedy. And I think Europeans tend to think a new Kennedy is better. I think that's true in France, Germany and Northern Europe. In France, at least, Dukakis has gotten a lot of coverage — charismatic, young, and, of course, Massachusetts like Kennedy. It's 'this is the guy who's going to turn around America.' But the people who are informed are worried about how far he's going to push the responsibility for NATO on Europeans."

**BELGIUM** (French-speaking): "Dukakis is certainly a bright man, but I would prefer to take less risk. I prefer Bush. Maybe America and the West know they'll have some problems with Bush, but Dukakis is interrogable (questionable). The bigger risk is Dukakis. Twenty years ago there was an anti-U.S. movement here, but today it is clear the Western World needs a super power. Washington is the Rome of today. Europe is the Greece, And Moscow is the Genghis Khan. Americans try to do things with good intentions, but sometimes with poor execution."

**ENGLAND:** "I saw Bush in San Diego last May. He really didn't thrill me. But on the other hand, looking at Mike Dukakis, particularly during the convention, I'm not too sure whether he's any more dynamic either. If I were to choose, I think I'd take Bush purely on his politics. From a British perspective, I might want to see Dukakis get in, however, because I'm a bit bored with the Republican scene. But from an aerospace point of view, some of the things Dukakis says disturb me. If he gets into office I can see I'll be covering less news. Some of the things like the National Aero-Space Plane would

be in jeopardy. Those are things that I'd want to journey on in 15 years time, so from that point of view I'd give Bush my vote. I think both men received pretty good coverage over here. We covered their conventions almost more than we cover our own."

**BELGIUM** (Flemish-speaking): "For me, Bush is more of an American because Dukakis is from Greece. That's very important to us. That's something we see as a problem. Dukakis is coming from Greece. You have another problem in America. The President never asks the people to say yes or no. You do not have referendums so you can speak your mind. So what you have in the U.S. is the freedom to elect a dictator. In Europe we can say yes or no to a question. Somebody who was popular with us was Kennedy, but there is no 'comparison' between him and Dukakis."

**FRANCE:** "For the French people, the differences between American Presidential candidates have always been very slight differences — depending first on personality and then on political programs. We don't understand quite well the program differences that you have. I think that Mr. Bush is a very serious man. He has always appeared as an excellent backup for Mr. Reagan. I'm afraid I don't know Mr. Dukakis sufficiently. I've been impressed by his cause but I have not been for or against either candidate. Basically, I'm interested in Mr. Bush's career and how he acted while he was vice president. On a more general point of view, we in France think it's regrettable that the electoral process in the U.S. stays the way it is, that some good candidates — or some that appear to be good — should be eliminated on more or less valid arguments from the first. We in Europe believe in a first term with many candidates and let the people say. That's not a criticism — just an opinion."

**BELGIUM** (French-speaking): "Dukakis has done a good job, it seems, but I'm not sure what the people of Massachusetts think. On international and widely economic subjects, Bush is prepared. While Dukakis has more sensitivity to social concerns, he must find a way in between — to support all different categories. I am astounded to read that Bush is not favored by women. The question is whether Bush has done better work than Dukakis. It seems that Dukakis is 'working with the devil' (selecting a man with opposite politics) in using Bentsen. Quayle shows to be young, efficient and dynamic."

**FRANCE:** "We prefer Bush to Dukakis. The relationship of Dukakis to Jackson is not helpful and we do not think that Dukakis is 'comparative' to John Kennedy. We think Bush is the better man to continue the same policies and actions of President Reagan. We think that Bush is improving with voters and we are very interested. My wife and I watched the Republican convention on Skychannel at 3 o'clock in the night."

## Fort Worth Awarded \$31.5 Million Contract

The U.S. Air Force recently awarded Fort Worth a \$31.5 million contract to modify an F-16D for the Variable-Stability In-Flight Simulator Test Aircraft (VISTA) Program.

The VISTA airplane will join the AFTI/F-16 as a one-of-a-kind, highly modified testbed for Air Force, Navy and NASA use. It will replace the Air Force Flight Dynamics Laboratory's current 30-year-old inflight simulator aircraft, the NT-33.

The VISTA will incorporate a variable stability system capable of inflight duplication of the dynamic motions and control responses of other aircraft. It is intended for flying qualities research and evaluation of new and modified aircraft designs as well as for training future test pilots.

The simulator will allow pilots to "fly" new aircraft inexpensively and safely prior to the actual first flight and before commitments are made to full-scale development

and production.

Most of the modification will be accomplished at Fort Worth. Plans are for the aircraft to begin flying in 1991 and remain in service for at least 25 years. Among other modifications, the VISTA's hydraulics will allow expanded use of flight control surfaces, said David E. Frearson, the Air Force's VISTA Program Manager.

The VISTA cockpit also will be modified from the standard F-16D configuration, Frearson said. The rear seat will be the command cockpit, while the front seat will be the simulation cockpit, he explained.

The simulator will have center and sidestick controls, and all controls and displays will be run by the variable stability computer, giving the pilot information that he would get from the aircraft being simulated, Frearson said.

Jesse M. Boulware is Fort Worth's Program Manager for VISTA.

## Our Commitment As Employees

- *We will treat one another fairly and with the dignity and respect due all human beings.*

(From the General Dynamics Standards of Business Ethics and Conduct.)



# General Dynamics Employees Give Their Views on Corporatewide Survey

**What was the overall reaction to the Employee Survey conducted in 1986? Was management sincere in its effort? Was the survey conceived in the proper fashion? Was it worthwhile for the employees and was it worth the cost to the company? Did appropriate changes result?**

These were the questions recently asked of employees throughout General Dynamics — and responses were as varied as the people who gave them.

Overall, most thought the survey was beneficial and should be repeated periodically.

Some felt the survey was too long. Others didn't like the line of questioning. Many said the changes were positive, while some claimed there was no real sign of change or that the changes were minor.

The survey was termed too extensive, while others said the expense indicated the company was sincerely interested in improving conditions and morale.

The following are condensed excerpts and quotes from employee responses:

## CESSNA AIRCRAFT COMPANY

**Carol Goodnight**, Secretary at Wallace Facility: The survey resulted in "improvements in communications . . . such as Grapevine and the CESSNAN (two employee publications) and the Career Assistance Program." It gave employees an opportunity to comment on company strengths and weaknesses at a time the company was going through turmoil. The Survey Action Plans were "correctly distributed to the responsible areas for problem solving."

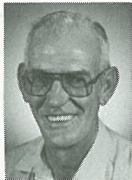
**Glen Fickel**, Project Engineer: The survey improved "the credibility of management and overall company operations." Since the survey, Cessna has "brought together a dedicated and closer working group of people." The new policy on smoking was positive, but more feedback is needed to help employees realize the program is still alive. "If a mistake has been made, it is that we have tried to put together too many action plans," thereby diluting results.



Goodnight



Fickel



Aitchison



Cannon

**Roy Aitchison**, Sheet Metal Assembler: "The survey was taken at a very bad time for Cessna, when production was down, morale was low and there was a lot of re-organizing." It has not accomplished much and the feedback and follow-through could have been better. Some things improved, "although not as much as I would like to have seen."

## CONVAIR

**Fran C. Cannon**, Contracts Administrator: The way people see the organization is through first-line supervisor policies. "It would be more cost effective to put money into supervisor training (instead of the survey). However, once in a while you've got to take the people's pulse to have data analyzed. If another survey is done, it should be on a more limited basis. Take the pulse instead of doing a total physical."

**Andrew W. Frank**, Manager-Financial Information Systems: "It increased the consciousness of management to employee concerns and showed employees what they think matters. We may have given employees the impression that every concern would be resolved. I'm not sure the post-survey process determined the levels at which decisions would be made. Some issues got bounced around."

**Barbara A. McDonald**, Chief-Integrated Logistic Support Administration: "The easily-solved concerns showed progress. However, many of the action plans involved policy changes that are ongoing and won't see resolution for a long time." Many felt that if the problem was not fixed right away it would not be fixed at all. We should tell people what can and cannot be changed and why. If we have another survey, it should be more subjective. People are more concerned about what is right in front of them.

**Ray R. Faller**, Chief of Tomahawk Structural Design: "The survey showed the company is getting the message across on time cards and ethics, but some of the personnel issues didn't seem to go anywhere. A pre-survey should be done first to get a feel for employee issues. I expect responses in the 1986 survey were age-related — a larger response from employees who have been around longer."

**Bill Galardi**, Group Leader: "There are problems at all levels of the company. The time spent was fruitful. The best thing was the opportunity to voice one's opinion without fear of reprisal. Management was sincere in addressing the employee concerns. Problems now are dis-

cussed, solutions looked for, and schedules planned and processed in a timely manner."



Frank



McDonald



Faller



Galardi

**Amando F. Sanchez**, Aircraft Assembler: Channels of communications between employees and supervision are improved. "We now have an opportunity to express our own feelings about our job and the conditions with which we are dissatisfied." However, some serious problems have not been resolved, such as getting proper lighting in Building 2.

## DATA SYSTEMS

**Joyce Jaskolski**, Senior Data Systems Engineer: It "created awareness at the management level that there are problems that needed to be addressed. It gave employees the opportunity to critique their managers and gave the upper level managers the opportunity to address those critiques. But, too much time has elapsed without any additional critique. In order not to lose momentum, another survey should be done soon."

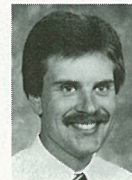
**George O'Connor**, Senior Software Engineer: "I'm not sure it accomplished anything. The issues that I thought were important weren't addressed . . . One was a vacation plan for receiving three weeks after five years and another was the flex benefits program being able to buy extra vacation time. The issues that were addressed were the issues that would cost the least. However, I did see some things accomplished and I thought management was interested in my concerns. Each division might want to survey its own people in the future."

## ELECTRIC BOAT

**Daniel P. Panosky**, Senior Engineer, Marine Engineering: Certain procedures and policies have been affected within the engineering group. Where immediate management had direct control, action plans were developed and implemented quickly. The time and money spent on the survey indicated management's sincerity. One drawback is that some employees were given time to complete the survey during work hours while others weren't. Therefore, some employees may not have devoted sufficient time to it.



Sanchez



Panosky

**Wilho Kallio Jr.**, Pipeshop Foreman: Perhaps the best thing was that each employee was given a chance to "speak" with the corporate office, airing opinions and concerns. Anytime a problem is identified and resolved it generally results in higher morale and productivity. But the survey was longer than necessary with some redundancy. It might be given to employees to take home and be returned in a month or so.

**August Zupka**, Technical Writer: Attention was brought to items that had been overlooked, ignored or forgotten. The best thing was that all employees were able to participate with the results evaluated by an impartial third party. But, some of the problems needed to be identified sooner. The work that went into the action plans paid off.

**Fay Allen Rucker Madry**, Personnel Representative: It created trust in management's effort to carry out the survey's intent. However, it is too early to ascertain if it was fruitful. The survey was supposed to be anonymous, but there were questions that effectively reduced a person's anonymity. Next time we might concentrate on a few problem areas, rather than try to address them all.



Kallio



Zupka



Madry



Hamill

## ELECTRIC BOAT/QUONSET POINT

**George Hamill**, Foreman-Welding and CAD/CAM Cutting Work Cell: The survey is an extension of the communications program in place at Quonset Point. Team meetings and skip level meetings with team members bring some of the issues to the floor, but the survey brought many more and allowed a more universal ap-

proach across the facility. "Quonset Point introduced me to participative management and it is an ongoing evolutionary process here."

**Marvin Taul**, Senior Welding Instructor: "Issues came into the open. Efforts to resolve problems have been fruitful. Knowing the company cares about its people and their environment is by far the best thing that has come out. The only negative is that the company's haste to make rapid changes on some of the environmental issues was too costly; however, I realize that the company wanted to demonstrate a willingness to address these issues."

**Irwin Lazarus**, Burner Grinder: "Issues were brought to the surface by giving everyone a chance to be listened to and, more importantly, to be heard. Several things have been done. What is good for the company is ultimately good for us. On the next survey, provisions should be made for more time to take the survey and to give help to those people who have difficulty in reading or writing their answers."



Taul



Lazarus



Shine



Williams

## ELECTRONICS

**William Shine**, Manager-Engineering Personnel: Crucial areas were pointed out that required and received management attention: communications, correction of poor or inadequate performance, pay/promotion/advancement policies. "We (Electronics Division) have some additional concerns that still need to be resolved, like more communication on performance feedback. One survey every three years would be an effective way of addressing employee concerns in our dynamic environment and changing corporate culture."

**Beverly Williams**, Program Manager - B-1B IATE: "An honest attempt has been made to get in touch with employees' feelings about their jobs and the company." But, "the inability to maintain the anonymity led some employees to be less than candid and others to choose not to participate. The changes generated have been superficial and sporadic, depending on functional management's attitude. Management's efforts have not been too successful, though I feel privileged to be affiliated with an organizational area that has done an outstanding job of responding to the action items."

## FORT WORTH

**Eddie G. Warren**, Electronics Electrician: "I'm sure it brought out some honest feelings on some issues, but I'm not sure everybody was honest." The survey questions were less than objective. "The (multiple choice) questions were sometimes selective. Sometimes, I think, the majority probably felt 'none of the above.' The 'management-employee gap' at Fort Worth was not filled. 'People on the line always refer to the company as 'they,' not 'us.' A second survey might be taken more seriously."



Warren



Stovall



Olson



Escher

**Janet L. Stovall**, Logistics Group Supervisor: It "conveyed the fact that top management is very interested in changing the General Dynamics management philosophy and gearing it more toward people. But it wasn't administered properly. The follow-up sessions were conducted by persons who weren't trained in sharing ideas and leading discussions and "as a result employees think their input wasn't listened to." There is a disconnect between top management's desires . . . and the people who should be implementing them.

**Diana Olson**, Text Data Processor: It made management aware of specific problems, although "as an hourly employee, I haven't noticed any major changes." The survey process also broke down in the follow-up meeting stage. "I think a lot of people were afraid to speak out because (they felt) there might be some retaliation later on." It seems "the farther up the (organizational) ladder you go, the more sincere management's intentions were."

**Stephen D. Escher**, Engineer-System Safety Analysis: "I'm not confident (it) accomplished much for the money spent, although it had some limited impact. It tended to further irritate employees. It was too much at once. We had ethics training, new time-card procedures, an idle time

(Continued on Page 4)



# More General Dynamics Employees Give Views on Corporatewide Survey

(Continued from Page 3)

survey . . . The company was trying to make too many changes. Another survey wouldn't really buy us anything. I'd rather see the money spent on improved quality for non-touch (office) employees and improved work flow."



Edwards

Liburdi

Millimet

Hayes

**Thomas J. Edwards**, Senior Project Tool Engineer: "Our management really took the survey seriously. They were eager to hear what the employees had to say. We have achieved some definite benefits within our department. There are several problems that need further action, like promotions and career paths." A second survey should be conducted on a smaller scale.

## GD SERVICES COMPANY

**Christine E. Liburdi**, Program Analyst: It was a positive step in determining the attitudes and concerns of the company's employees. The confidentiality allowed employees to express their true feelings. Management was sincere in trying to correct problems "and they were successful in areas such as time-card reporting, expense reporting and other ethics-related issues." Some issues remain unresolved, however, like top-down communication and insufficient dissemination of information regarding job opportunities, promotion criteria and alternate career paths within the corporation.

## LAND SYSTEMS

**Stanley Millimet**, Assistant Program Manager: Employee expectations may have been too high, thinking management would correct every problem. "I'm sure there are some managers in Land Systems who believe employees should be seen and not heard, but I'm convinced they are the small minority. The methodology of preparing the action plans and reporting them back to the employees was done very openly, which employees appreciated. The questions, however, didn't lend themselves to solid statistical analysis. The results were open to interpretation."

**James A. Hayes**, Engineer Analyst, Quality Assurance: "It was worthwhile and brought out many issues that needed to be addressed: concerns for people who don't smoke; the ethics program; improved air quality with ventilators; and the benefits that will be offered in 1989. But . . . I haven't heard anything about the employee recognition plan yet. And in 1987 a personal ombudsman was established in Human Resources to serve all locations. I don't know who that individual is." A once-a-year survey would open lines of communications . . . it's well worth the money and the time.



Flatt

Torbert

Picciariello

Raines

**Gary R. Flatt**, Quality Control Inspector: The Job Opportunity Awareness Program was one of the best programs to come out of the survey. "It's given me a chance to interview for jobs that I wouldn't have known about." Company commercials are on TV and ads have appeared in different magazines. "It makes me feel good that the company wants to improve its overall image." However, day-to-day communications between management and employees are weak. The survey was "well written, thorough, professionally done, and the questions were clear, concise and to the point."

**Marilyn A. Torbert**, Assembler/Fitter: "The openness through improved communications, the ethics and enhanced safety programs were the best things to come out." However, questions were often unclear. We still haven't resolved the relationship between management and hourly employees. "You still have some managers who are sincere and some who just do not care." More surveys would be a waste of time. Instead management employees should attend management school. There is a difference in managers who attend those schools.

## MATERIAL SERVICE

**Ann Picciariello**, Accounting Technician: The survey opened the door for communicating areas of concern such as public relations and the dental plan. "Once the issues from the first survey are addressed, we should have another. Continued two-way communication will improve effectiveness, efficiency and the well-being of the corpora-

tion and each of us as individuals."

**Phil Raines**, Assistant to the V.P. of Operations: "Though the first survey allowed employees to express their opinions, some wouldn't because they were somewhat apprehensive. The main problem identified in our group was the communication gap among different levels of management. Due to recent changes in management I don't think we're ready for another survey. Let's wait and see what this one will accomplish."

## POMONA

**Kimberly Walz**, Senior Human Resources Representative: The signals sent were as important as the actual results. This was the first time Corporate solicited employee input on such a broad range of issues. It wasn't cost-effective. A sampling of 10 percent is highly accurate. However, it created employee "buy-in" and thus was not wasted. It also was "too darn long and repetitious." There are still serious issues facing the company, such as child-care service, compensation and promotion policies, vacation time, pay equity and other global issues. "We seem to be taking care of little things, and not really solving the big challenges."

**Val Golec**, Painter: "Things have improved, but not by much. The day shift and night shift still don't communicate very well . . . to correct problems between shifts. We voice our problems to supervision, but problems don't get corrected. We've tried to get lights installed in a spray paint work booth for months." Things could get better if management was sincere about letting the people speak out. "We had one feedback meeting and then the whole thing died down. We need more meetings and follow-through."



Walz

Golec

Dooley

Drake

**Debi Dooley**, Secretary: It didn't accomplish as much as Corporate expected. "I'm sure it was expensive and perhaps it wasn't a total waste of time in terms of employee morale." Only half of the employees would volunteer to participate if it was conducted now, because there was a perception of inadequate feedback and lack of management commitment on major issues. "I don't expect everything to be solved, but it would be nice to see a sincere and ongoing effort. The worst part of the form was the demographics data which asked for detailed information like your department, classification, race, sex . . . items which could be used to identify the individual."

**Paul Drake**, Engineer: The survey produced major improvements in working conditions, especially with the nonsmoking policy and the hiring authority that has returned to a department-level responsibility. On the other hand, management "doesn't seem to care about the working environment for engineers. They have increased the density of the cubicles and changed the seating . . . which is not conducive to productive work." However, the survey was worth the effort because employees expressed their honest opinions.

**Timothy King**, Microwave Assembler: Not much impact has been seen. "Things are a little better now and supervisors take more of a human approach in treating you like a person. But I'm not sure the survey had much of an effect on that attitude change. It's always good to get input from employees, and I'd like to see us do it again just to find out what happened between surveys."

## POMONA/CAMDEN

**Barbara Pace**, Electronics Assembler: "It was not a waste of time. We need more updates on issues for things to get better on the line." The smoking policy was good, but the inconsistent treatment by some management personnel toward employees was bad. "Some people who try their best to produce quality hardware are sometimes treated worse than others who aren't trying hard enough." Although initial actions were sincere, attention has slacked off. "They (management) know what's going on, but they sometimes just don't seem interested in solving some of the problems that remain."



King

Pace

Billingsly

Cono

**Jerry Billingsly**, Maintenance Technician: The survey was fruitful. Employees expressed their feelings to management, which was sincere in its follow-up. "Things are

not always solved the way we want. Maybe we should take 10 minutes every month to attack specific small problems that have been brought out into the open, and not let them grow into bigger problems. The company should randomly select small sections or questions from the survey and send them out more frequently for quicker input."

## SPACE SYSTEMS

**Gary Cono**, Program Manager: "I thought and still think that the survey was breaking fresh ground for this corporation. It caused good, positive change, has helped facilitate communications and improved working conditions. It also created more respect among and for fellow employees. There are still unresolved issues, but I think the company is working on those."



English

Gentry

Masterson

Correa

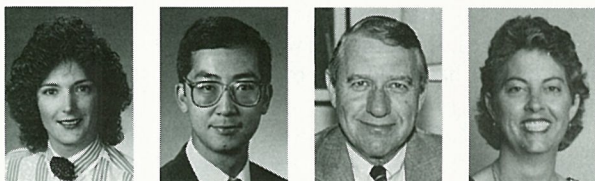
**Durwood English**, Manager-Program Planning and Control: The time was just right for this survey. The follow-up was good where possible. "Issues that went to our corporate office seemed to have moved very slow and published reports in *General Dynamics World* appeared to be very vague." With so many new employees, having a survey every three to five years would be a constant gauge on employee opinions. The actual survey was a bit long, but all areas covered were good.

**Bob Gentry**, Metal Fitter/Tank Fabricator: "The survey was helpful in bringing out employee concerns, especially working environment and conditions. The best thing about it was the way it was approached with department meetings and action plans. The worst thing is that a majority of those items haven't been done. It went after key ideas and issues important to employees, but I think taking it home to think about and study would be better."

**Mike Masterson**, Senior Financial Analyst: It was a good attempt to get feedback from employees and was a long time coming. It certainly enhanced communications. Follow up was good. The general reaction was that the company was trying to remedy problems. The survey should be an ongoing process every three to five years. "Some people are still timid about sharing their REAL opinions, but that'll go away as this becomes more institutionalized."

## VALLEY SYSTEMS

**Robert A. Correa**, Design Drafter: Management was made aware of employee concerns. Future surveys should be conducted although only a scientifically selected cross section should be surveyed. The company would save costs and the results would still reflect overall employee concerns. As a smoker, however, the no-smoking policy wasn't a good idea.



Veiga

Hui

Maul

Schaefer

**Kimberly L. Veiga**, Cost Analyst: A new company is providing food service at Valley Systems in response to employee comments. The survey gave employees an opportunity to voice their opinions and to "air any bad feelings." However, employees did not receive all the results. "They just weren't passed on."

**Kenneth H. Hui**, Section Head-Electro-Optical Guidance Design: The employee surveys are necessary to maintain communication, but faster feedback from management is needed in the future. Surveys "are a vehicle for employees to express their concerns to management."

## WASHINGTON OFFICE

**Paul Maul**, Corporate Program Manager: "The best thing was that management took it seriously and it was clear that employee attitudes were considered very important. However, the rush to fix everything in such a short time and the accompanying avalanche of paperwork were major drawbacks. Pay and career opportunities will always be key issues and will probably never be resolved to everyone's satisfaction, but a serious effort has been made to resolve those concerns."

## CORPORATE OFFICE

**Maureen A. Schaefer**, Finance Representative: The

(Continued on Page 5)



# Employees Report Variety of Opinions

(Continued from Page 4)

survey showed that the corporation was interested in hearing from its employees as to their thoughts on how the corporation could improve itself (from within). It also showed there were a lot of unhappy employees — but, it is easier to find fault than to praise. No matter what the corporation tries to do to improve its image with its employees, there are always people who will complain.

## Savings and Stock Investment Plans

	Annual Rate of Return for the 12 Month Period Ending:		
	July 1986	July 1987	July 1988
<b>Salaried</b>			
Government Bonds	14.0%	5.8%	7.2%
Diversified Portfolio	29.4%	42.4%	(11.0)%
Fixed Income	12.1%	11.7%	10.9%
<b>Hourly</b>			
Government Bonds	13.4%	6.0%	7.4%
Diversified Portfolio	29.5%	44.8%	(11.4)%
Fixed Income	12.1%	11.8%	10.9%
<b>GD Stock Closing Price</b>	\$70.50	\$67.87	\$52.87
( ) Negative number			



**Changing of the Guard.** An F-16 Fighting Falcon of the Alabama Air National Guard's 187th Tactical Fighter Group flies past the state capitol in Montgomery, Ala. The 187th TFG, based at Dannelly Field in Montgomery, is re-equipping with F-16s.

## General Eaglet Predicts That the F-16 Program Will Total at Least 5,000 Aircraft Worldwide

By Joe Stout

Maj. Gen. Robert D. Eaglet, the U.S. Air Force's F-16 Program Director, said planning calls for the Fighting Falcon to continue to serve as the "low" element in the Air Force's high/low fighter force mix for the foreseeable future and could lead to production of more than 5,000 aircraft.

The current "high" element, the F-15, is scheduled for replacement by the ATF in the mid-1990s, he said. "There's nothing in the future that is going to put the F-16 out of business," General Eaglet said.

General Eaglet discussed the future relationship of the F-16 and Advanced Tactical Fighter (ATF) in remarks he made at a recent symposium for F-16 subcontractors in Fort Worth.

"It's the only aircraft that we can afford to buy in sufficient quantity, along with the relatively lower quantities of the ATF, to meet our force structure needs," he said. "I would expect (the program) to go to at least 5,000, maybe even 6,000 F-16s."



General Eaglet

Currently, more than 2,170 F-16s have been delivered worldwide.

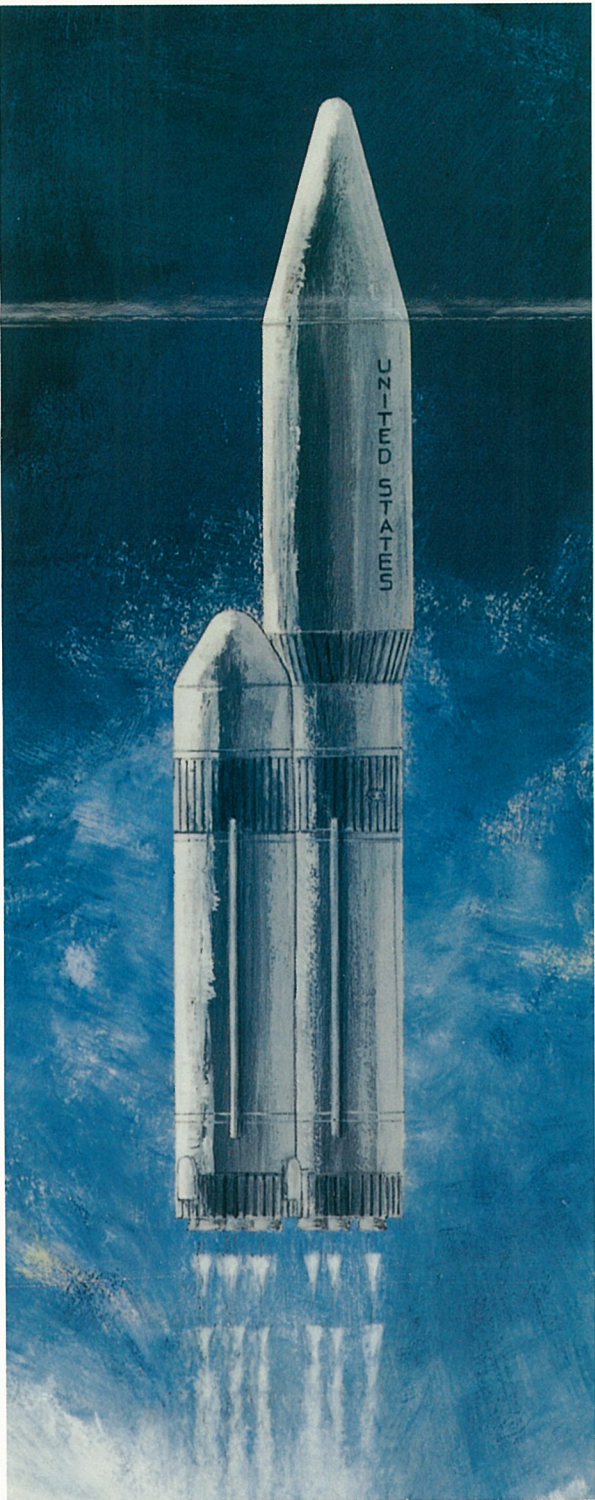
"We can't afford to start another aircraft program (in addition to the ATF effort), so we're going to have to continue to improve the F-16," the general said. "The potential exists, we think, for an entire follow-on, multinational fighter program like the original F-16 program."

General Eaglet referred to the proposed Agile Falcon F-16 derivative as a likely choice for such a follow-on configuration. "It would be a lot more agile and maneuverable than the future Soviet threat (aircraft), and would keep the F-16 viable well into the 21st century," he said.

"We are associated with a system that is truly a success story," he said.

General Dynamics has proposed codevelopment of the Agile Falcon to the USAF, Belgium, Denmark, the Netherlands and Norway. The concept calls for a larger-winged F-16 variant incorporating advanced materials, avionics and propulsion systems.

General Eaglet was a keynote speaker at the seventh annual F-16 Industrial Modernization Incentives Program Symposium attended by approximately 300 subcontractor, Fort Worth and Air Force personnel.



**Artist's Concept.** Space Systems Division is one of three U.S. contractors recently awarded a study contract by the U.S. Air Force for the Advanced Launch System (ALS). The contract covers systems design and technology demonstrations through preliminary design review. ALS is expected to provide the United States with a low-cost launch vehicle system to lift a wide range of future spacecraft. An artist's concept of the General Dynamics ALS design is shown above.

## Exhibit Set Up at Urban League Conference To Acquaint Attendees with the Company

General Dynamics held an exhibit at the recent National Urban League 1988 Conference staffed by representatives from the Corporate Office, Electric Boat, Land Systems and Pomona.

The conference, held at Cobo Hall in Detroit, featured the theme, "Working Together To Make a Difference: Rights, Responsibilities, Results."

The Urban League is an interracial nonprofit community service organization with headquarters in New York and offices in 112 U.S. cities. It uses education, social work, economics, law and business management to secure equal opportunities for all minorities.

General Dynamics used the exhibit to acquaint attendees with the company's defense role, to recruit and to inform suppliers of the procedures required to do business with the company.

Representing General Dynamics were Robert L. Abernathy, Corporate Director-EEO/Ombudsman Program; Lewis Cornelius, Electric Boat Manager-EEO Programs; Melvin Ryan, Land Systems Material Compliance Chief; Owsley G. Spiller, Land Systems Manager-EEO and Affirmative Action; Robert E. Smith, Pomona Senior Human Resources Representative; and Jill M. Shaw, Land Systems Human Resources Representative.

More than 16,000 persons attended the conference.



**Company Display.** Staffing the General Dynamics exhibit at the National Urban League 1988 conference held recently in Detroit are (left to right) Robert E. Smith, Pomona Senior Human Resources Representative; Lewis Cornelius, Electric Boat Manager-EEO Programs; Robert L. Abernathy, Corporate Director-EEO/Ombudsman Program; and Owsley G. Spiller, Land Systems Manager-EEO and Affirmative Action Programs.



# Successful Cartoonist at Electric Boat Is a Self-Taught Artist

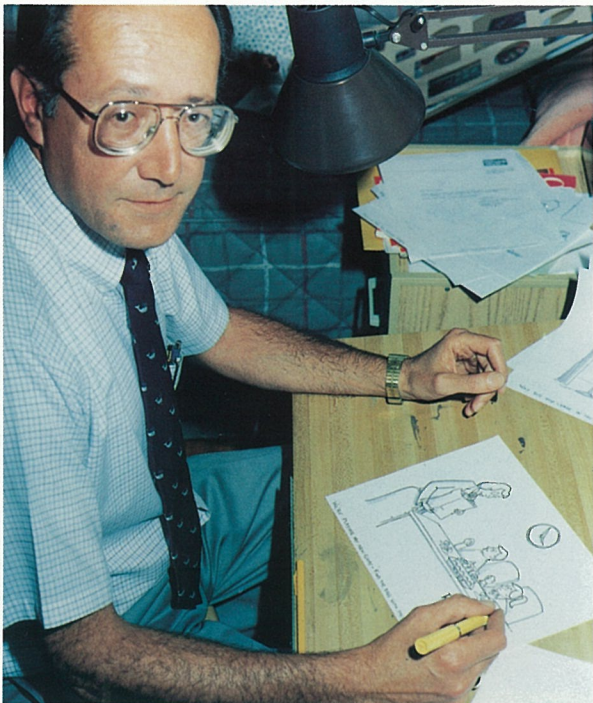
By Graham Gavert

Robert A. Palazzo, Chief of Purchasing-Offload at Electric Boat, has drawn his first breath of success. He recently had the thrill of seeing one of his cartoons published in the July/August issue of *The Saturday Evening Post*.

A self-taught artist, Palazzo has drawn cartoons seriously for the past two years. He has been sending samples of his work to national magazines — and, he said, been “rejected by the best magazines in the industry.”

But that changed a few months ago when he was notified that a cartoon he submitted to *The Saturday Evening Post* was accepted for publication.

The cartoon, like many of Palazzo's other samples, draws from everyday life for its comic impact. The drawing features a woman driver who has run into a phone booth. The phone is dangling inside the car, and she is telling someone (probably her husband) that the good news is they now have a phone in the car.



Cartoonist Robert A. Palazzo in His Studio

Palazzo said an effective cartoon has to tell an instantaneous story. “It’s a moment in time, with an assumed past, a visible present, and an implied future,” he said. “Often the comedy lies in this last part.”

In *The Saturday Evening Post* cartoon, the reader knows the woman has just said, “I’ve got good news and bad news.” The cartoon shows her delivering one-half of the news and implies the shock on the other end of the phone when she continues her story.

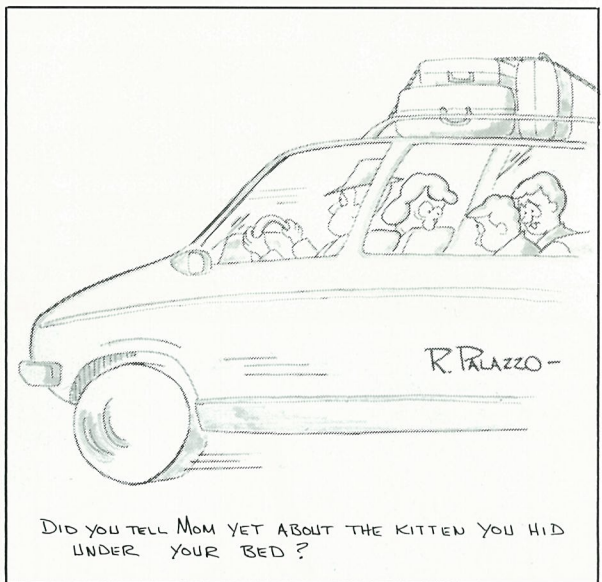
Palazzo said facial expressions and dress also are crucial. “Showing people just talking to each other isn’t going to be very funny,” he said. “It’ll make them look stiff and frozen.” Sometimes Palazzo will make as many as 30 modifications to get all the elements just right.

A cartoonist has only a moment to capture the reader’s attention, so considering audience response is important. For instance, Palazzo said, cartoons are read from left to right, so the cartoonist should arrange the people or objects to complement this natural tendency of the eye to

move from one direction to the other. Shading can also be used effectively to draw the reader’s eye to a focal point. “Sometimes, if the cartoon has more than one person,” Palazzo said, “drawing the speaker with darker clothes identifies who is speaking the punch line.”

Palazzo has learned these tips through trial and error. Rejection slips don’t come with explanations, so a cartoonist has to do his best to learn the unwritten rules. Palazzo spends many hours practicing each week in a small room with a drafting board to improve his chances for publication.

A last bit of advice from Palazzo: It’s always good to familiarize yourself with a magazine’s advertisers. “A cartoon editor is going to accept work that doesn’t conflict with the likes and dislikes of the people who advertise in the magazine,” Palazzo said. “If the publication seems interested in promoting health and fitness, for instance, then you’d better not draw a person who smokes. That is, unless you’re pretty confident the cartoon shares the magazine’s attitude on smoking. The same is true for issues like drinking or dieting. It’s a good idea to be sensitive to what the magazine seems to want to convey to its particular audience.”



## Russian Inspectors Visit Convair Plant Under INF Treaty

By Julie C. Andrews

At 3:15 a.m. on Sunday, July 3rd, George W. Roos, Vice President of Human Resources at Convair, received the call that he had been anticipating ever since ratification of the Intermediate Nuclear Forces Treaty. A team of Soviet inspectors was on its way to San Diego to inspect Air Force Plant 19, site of former production of the launchers for the Ground Launched Cruise Missile, now banned by the treaty.

As coordinator of Convair’s inspection preparation, Roos and his team of escorts, all volunteers from various division functions, had undergone extensive training, including that of the Russian language for some and the terms of the INF treaty for all. Convair held several mock inspections before July 1st, the day after which inspections could begin. Overall, the Convair effort is sponsored by the U.S. Air Force Aeronautical Systems Division, part of Air Force Systems Command, Wright-Patterson AFB, Ohio.

Several hours after Roos’ early morning notification, all Convair personnel were assembled and ready at Plant 19. The C-141 from Travis AFB carrying the Russians and the On-Site Inspection Agency (OSIA) contingent touched down at the San Diego airport at 6:26 a.m. and taxied to a parking area near the Lindbergh Field plant’s parking lot, which borders the airport.

The first Russian off the plane, team leader Vyacheslav

Vasiliyevich Kharlamov, appeared not to understand initial greetings in English.

“I decided to try out my Russian and wished Kharlamov a good day and told him my name,” Roos said. “This brought on a big smile and a handshake and the remainder of the Russian delegation and OSIA escorts came off the plane.”

Because the treaty allows only 24 hours for the verification inspections, no time was lost in getting the entourage from the airport to Plant 19, a short distance away. After a welcome and briefing on logistics and safety, the Russians retired to the trailers that had been set up to house them during their stay.

The inspection began at 8 a.m. Sunday morning, only five hours after the initial notification.

During the next 24 hours, the 10 Soviet inspectors, accompanied by OSIA and Convair escorts, looked at all areas of Plant 19. Each two Convair escorts carried a 30-meter tape measure, a flashlight and a radio. One of the most important items of the treaty allows inspection of spaces only of a certain dimension large enough to contain a treaty-limited item.

“The obvious familiarity of the escorts with the terms and critical dimensions of the treaty was evident and impressive,” Roos said.

Other Convair employees, including riggers, mainte-

nance people, plant guards, firefighters, a locksmith, Canteen Services food preparers and a telephone operator, stood by to facilitate access to the plant and provide hospitality to the visitors. The telephone operator was on duty the entire time to place calls to the one location allowed the Russians under the terms of the treaty — the Russian Embassy in Washington, D.C.

On Monday morning, the 4th of July, while most of the San Diego work force was enjoying picnics, parades and other holiday outings, the Soviets and the OSIA and Convair teams assembled for a ceremony, at which the report written by the Russians and commented on by the Americans was signed by the OSIA and Russian team chiefs.

Thirty-one hours after landing in San Diego, the Russians and OSIA escorts took off for Travis AFB, Calif., to link up with four other inspection teams and return to the Soviet Union.

“The inspection was upbeat,” Roos said. “Our escorts were thorough, professional and friendly, and the support people were always available when needed. We got high marks for our hospitality, and they loved the food. Half of the success of the INF treaty verification rests on the people-to-people contact, and our Convair people did a superb job in representing the company and the United States.”

## Stinger Selected by Swiss Defense Ministry

The Swiss Defense Ministry has chosen the General Dynamics-produced Stinger missile over the French-built Mistral for its man-portable air defense system. Swiss Parliament approval of the selection is anticipated in the fourth quarter of 1989.

“The selection of the Stinger missile by the Swiss Ministry of Defense is yet another recognition of that system’s proven effectiveness and reliability,” said General Dynamics President and Chief Operating Officer Herbert F. Rogers.

William M. Leonard, Valley Systems Division Vice President and Program Director - Stinger Weapon Systems, said the award “represents the second largest man-portable air defense purchase in the Free World.”

Under a license agreement with Switzerland and with U.S. Government approval, the Stinger-RMPs (Reprogrammable Microprocessor), without the reprogrammable module, could be produced by Swiss industry. Valley Systems Division in Rancho Cucamonga, Calif., where Stinger is produced, would fabricate and install selected test equipment required by the Swiss.

Valley Systems would also furnish key hardware items through Foreign Military Sales procedures and provide technical assistance to meet the Swiss production line start-up schedule.

Stinger has been produced by General Dynamics since 1978 and was first fielded by U.S. forces in 1981.

GENERAL DYNAMICS

# World

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## Daniel DeChaine Returns to Olympics But Not As a Competitor By Larry Elwell

About the time many members of this year's U.S. Olympic delegation were born, Daniel DeChaine was experiencing the atmosphere of the Games for the first time. He wasn't a competitor, but his role was just as vital.

DeChaine was the armorer during the 1968 Games, a position he maintains at this year's Olympics in Seoul, South Korea. As armorer, the technical expert on equipment design, construction and maintenance, he is serving as the technical director of the U.S. Fencing Association equipment committee, one of the top five positions in fencing.

For more than 25 years, DeChaine, a manufacturing engineer at Pomona, has been a part of international fencing. His interest began as an 80-pound freshman at Pomona College when he had to choose from three survival classes to fulfill his physical education requirement.

"The first day I tried wrestling and that didn't work out," he said. "The second day I tried boxing and that was even worse. Finally, I tried fencing."

He not only fulfilled his requirement but went on to become one of the world's top fencers. He participated in national competitions in the three fencing events — foil, epee and saber — once gaining a medal in all three events during a meet in Mexico. Each event has its own strategy, rules and target areas, he said.

DeChaine's finest event, however, was epee, in which he won a gold medal for five consecutive years and remained unbeaten for three straight years at the Northern Mexico tournament.

That success, however, never led to a berth on a U.S. Olympic or Pan-American squad because of a technicality. "I accepted a position as a professional coach at Pomona College and it turned out to be the dumbest thing I ever did," he said. "Because I was paid for participating in the sport, I was disqualified from ever competing in the Pan-Am Games or in the Olympics."

The decision haunted DeChaine for years. By the time the Olympic Committee relaxed its rules governing professional payment, it was too late. "I was no longer able to

withstand the strenuous physical challenge of Olympic competition," he said.

DeChaine's coaching, like his fencing, has been marked by excellence. He particularly savors the victory his freshman team recorded over the University of California-Berkeley varsity squad.

Coaching also helped him gain his role as armorer. He learned how to maintain the team's equipment while at Pomona College. He took that expertise and began developing and improving weapons for his team. As his fame spread nationally, other fencers began sending their equipment to him. He was named armorer in the Pan-Am Games and his reputation grew.

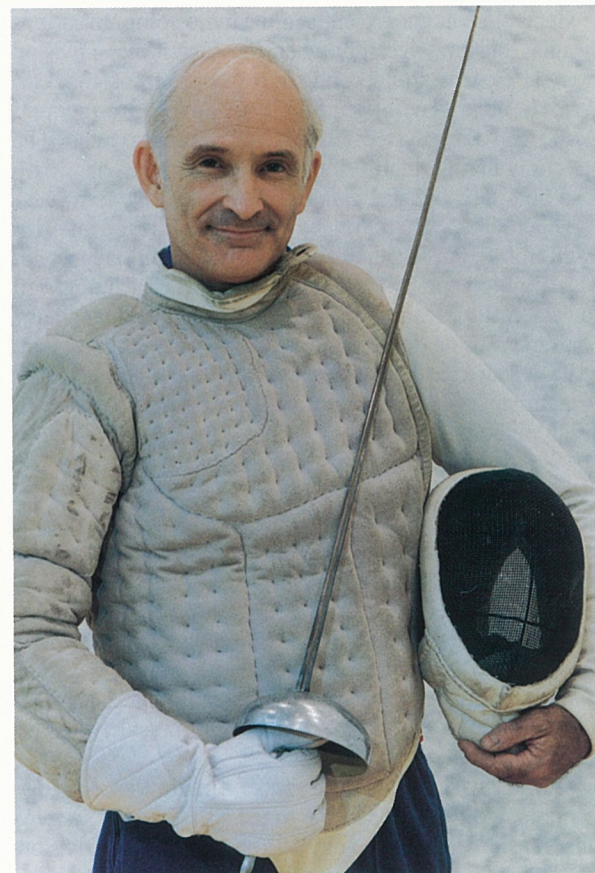
DeChaine said that fencing hasn't changed much since it evolved from a combat role. The biggest difference, he said, occurred in 1932 when electronics were introduced for more precise scoring. The electrical system consists of a switch, mounted in the tip of the weapon, and a wire, which runs its length. When a fencer touches his or her opponent, a light flashes and a buzzer sounds.

During DeChaine's first Pan-Am competition, he was assisting the Cuban team, which was without an armorer. When the Americans and Cubans entered the gold medal round, the Cubans demanded he continue to service their weapons.

"There is gentlemanly conduct in fencing," he said. "Once I sat up all night with the Soviet armorer to help fix their equipment at the 1969 World Championships."

Meanwhile, DeChaine has become the first American to serve on the nine-member international fencing committee, which governs modifications and improvements in equipment. "Our main goal is to ensure that no equipment gives a competitor an unfair advantage over another," he said.

The tedious work has made for long hours at the Olympics, DeChaine said, adding he felt some individual members of the team performed well even though the team didn't expect a medal. He said the American team was at a disadvantage because the United States does not



Daniel DeChaine, Pomona Fencing Coach

sponsor its athletes, most of whom have full-time jobs in addition to their training.

DeChaine is quick to credit General Dynamics with giving him the ability to meet the challenges of his specialized sport. "I really appreciate the help given by my coworkers and supervisors," he said. "The company has done all it could to encourage me."

## Production of RAM Reaches Milestones

Several milestones have been recorded in the production of 35 Rolling Airframe Missiles (RAM) at Valley Systems.

The first two major subassemblies, the microwave assembly and the seeker head, have been completed and have passed stringent division environmental testing.

The remaining 34 microwave assemblies and seeker heads, now in production, will also be tested at Valley Systems this year and next prior to being assembled into guidance sections.

Lloyd L. Torrey, Director-RAM Production and Support Engineering, said, "The two subassemblies are the hardest parts to produce because of the large amount of hands-on labor and tight tolerances."

Deliveries of RAM to the U.S. Navy will be made between April 1989 and February 1990 and will be followed by flight tests between June 1989 and May 1990.

The division expects to receive a contract for 500 missiles from the U.S. Naval Sea Systems Command. Production contracts after the initial award will be issued on a competitive basis between Valley Systems and a West German firm.

RAM is a lightweight, quick-reaction, high-firepower missile system designed to provide antiship missile defense. The system is being cooperatively developed by the U.S., West Germany and Denmark.



**RAM Microwave Assembly.** Cheryl Keating, a Valley Systems development assembler electronics, works on the first RAM microwave assembly, one of the major subassemblies for the system.

## Pace: First-Time Quality Is the Company's Goal

If designs and processes were optimized so everything could be "done right the first time, every time," the company's production costs could be reduced by as much as 50 percent, while increasing profits and the reliability of weapons systems.

That was the message of a recent speech made by Stanley C. Pace, Chairman and Chief Executive Officer, to members of the F-16 subcontractor community in Fort Worth. His remarks followed praise of the F-16 program by Anthony J. DeLuca, Competition Advocate of the U.S. Air Force.

Pace shared General Dynamics' approach to becoming more cost-competitive with representatives of associate companies that provide components and materials for the F-16 program. He included remarks related to the company's separate VRP initiative.

"Cost-competitiveness is not solely a productivity program," he said. "Cost-competitiveness starts with the beginning of design. All functions must work together. We have to eliminate processes that keep us from producing the product right the first time."

Herbert F. Rogers, President and Chief Operating Officer, established VRP as an important corporatewide initiative. The VRP concept stresses quality and cost-effectiveness of products from the development and design stages through production and for future field use.

To achieve these goals, VRP comprises three major elements: Statistical Process Control, the Taguchi Method of design analysis and experimentation and Quality Function Deployment, a process used to determine true customer requirements.

The ultimate goal of VRP is to reduce product variances that result in scrap and rework in production and reliability and maintainability problems in the field.

VRP is described as a major change in General Dynamics' way of doing business.

Pace was speaking at the second annual Falcon MAP symposium. Falcon MAP is a cooperative Air Force and contractor program designed to ensure the future supportability of the F-16 fleet.

## Submarine Miami Launch Is Scheduled For Nov. 12th at EB

The 688-class, fast-attack submarine *Miami* (SSN 755) is scheduled to be christened on Nov. 12th at Electric Boat's shipyard in Groton, Conn.

Sponsor of the ship will be Mrs. Jane Wilkinson, wife of Vice Adm. Joseph B. Wilkinson, Commander, Naval Air Systems Command. Their daughter, Dr. Mary Wilkinson, will serve as matron of honor.

*Miami* is the first submarine and the third U.S. Navy ship to bear the name, which honors the city in Florida. The first *Miami*, a sidewheel gunboat, was commissioned in 1862 for service in the Civil War. The second *Miami*, a light cruiser, was commissioned in 1943 and earned six battle stars in World War II.

The christening will be the third held this year at Electric Boat. *Topeka* (SSN 754) was launched on Jan. 23rd, while the Trident submarine *Pennsylvania* (SSBN 735) was launched on April 23rd.

## Subcontracting Firm Honored for Efforts To Improve Products

Hitchcock Industries of Bloomington, Minn., recently became the first recipient of the F-16 Industrial Technology Modernization/Be Proud America Annual Productivity Improvement Award. The firm was honored by Fort Worth for its achievements in competition with the entire F-16 subcontractor community.

Hitchcock Industries manufactures air inlet duct frames and speedbrake components for F-16 Fighting Falcons.

The award was established by the U.S. Air Force and General Dynamics to recognize F-16 subcontractors who have displayed superior productivity and quality improvement efforts. "The award is intended to create awareness of the importance of quality and productivity throughout the defense industry, and to encourage F-16 suppliers to seek continuous improvement in those areas," said Lewon D. Simpson, Fort Worth's Vice President-Material.



# SINGARS Returns Company to Communications Business

By Myron R. Holtzman

General Dynamics re-entered the radio communications systems business recently when the Electronics Division was selected as the second-source supplier of the U.S. Army's next generation Single Channel Ground and Airborne Radio System (SINGARS) tactical radio. The selection in this high-priority program could be worth \$3-5 billion to General Dynamics over the long term.

The radios, which will be produced in tandem with Tadiran Ltd., an Israeli electronics firm, are initially worth \$22.1 million for 550 receiver-transmitters, including 150 for operational and first-article testing, and ancillary equipment to be delivered in 1990. Another 400 units are to be delivered in 1991. There also are three options for up to another 28,600 units that could lift contract value to \$191.3 million.

"We welcomed the opportunity to compete for SINGARS," said Ad R. Mosco, Corporate Director-Pricing. The Army sought competition for the program because the incumbent supplier was experiencing cost, schedule and reliability problems, Mosco said.

"The Army wanted a highly reliable, cost-effective unit and felt that new competition was needed to achieve this," Mosco said. "By joining with Tadiran, we thought we could come up with a reliable, cost-effective radio that is a 'form, fit and function' equivalent to and interoperable with the existing design."

Tadiran, which already produces a radio that employs technology directly applicable to the SINGARS system, will transfer that technology to the Electronics Division for the basic design. Electronics will add frequency-hopping and antijam features and integrate the total system.

"We had discussions with Tadiran in early 1987 with regard to our teaming for this competition," said Gene Heizer, Program Manager and Division Vice President-Research and Engineering at Electronics. "We had determined that the Tadiran radio was an outstanding baseline system. However, there were other aerospace companies also seeking to team with them. After considerable discussion, our team was formed." The final agreement between

the partners was reached during the Paris Show in June 1987.

The General Dynamics-Tadiran team then won the competition for the contract over Harris Corporation and a team of SEL of West Germany and Raytheon. Earlier, two other firms, Cincinnati Electronics and Magnavox, were eliminated from the competition.

The SINGARS program returns General Dynamics to the radio business for the first time since the late 1960s when the division — then based in Rochester, N.Y. — produced the WRC-1 and GRC-106 models, some of which are still in use by the services. Both General Dynamics and Tadiran will carry out the production of the radios in facilities at Tallahassee, Fla.

How did the General Dynamics/Tadiran team devise its winning package?



SINGARS Radio

"We employed a 'no stones unturned' approach that resulted in doing business differently in many areas," Heizer said. "We used current technology in the design and manufacturing approaches and combined this with different management approaches to produce the winning bid."

The bid was based on a "could-cost" assessment to identify high payoff areas. Under the approach, teams of specialists in engineering, production, contracts, materials and estimating were assembled to brainstorm, analyze requirements, plan and assess cost reduction thrusts.

Overhead and labor costs were significantly reduced as a result of the city of Tallahassee providing SINGARS facilities valued at \$6 million and then leasing the facilities back to General Dynamics and Tadiran for \$1 per year for 10 years.

"That had significant bearing on our bid," Heizer said. "The city was willing to do it because there is no industry in Tallahassee and they looked at us to be a catalyst for other industry to move there."

Combined approaches reduced by 42 percent the previous baseline costs for the design, material, labor and overhead costs — and most important, a bid significantly below the competitors' prices.

Specialists worked for several months to lower the costs in labor, overhead and materials before making the bid recommendations.

"We submitted the bid, but continued with our cost reduction efforts," Heizer said. "We then had an onsite review with the Army, made our BAFO (best and final offer) and waited for the Army to make its selection. When we got the call, we were elated. It certainly was one of the most rewarding experiences I've ever had."

The U.S. General Accounting Office also was impressed. In its report GAO officials said:

"When the evaluation was completed, General Dynamics had received scores that were equal to or higher than its competitors in (each) of the five technical areas, and at the lowest price."

\* \* \* \* \*

## Tadiran Is an Impressive Partner with Electronics Division in SINGARS Program

What is Tadiran Ltd. and how did General Dynamics decide to team with the firm in the Single Channel Ground and Airborne Radio Systems (SINGARS) project?

Tadiran is an Israeli company established in 1962 to meet the communications needs of the Israeli Defense Forces. It has manufacturing plants in Israel, including one in Tel Aviv, and a manufacturing facility in New York. It also has sales offices throughout the world, including several in the United States.

Tadiran has grown to become an impressive, high-technology electronics firm that provides battle-proven products in the tactical Command, Control and Communications (C3), Electronic Warfare (EW) and Electro-

optic (EO) arenas.

It is the largest privately owned electronics company in Israel. Under the leadership of 46-year-old Yigal Ne'eman, who has been President and Chief Executive Officer for the last five years, Tadiran has grown into a company with more than \$800 million in annual sales and 12,400 employees.

The company is organized into six operating groups offering C3 and EW systems and remotely piloted vehicles (RPVs); VHF, HF, and UHF radios; commercial PBX, telephone switches, and transmission products; electro-optic devices; batteries and micro-electronics; and electrical appliances.

Tadiran specializes in military communications equipment. By combining this expertise with other technologies, Tadiran produces state-of-the-art equipment.

After General Dynamics decided to increase its penetration into defense electronics, it looked for a way to capitalize on proven, developed technologies and products that would allow reduced development time, faster market entry, decreased cash investments and lower risks.

Following discussions with several domestic and foreign electronics firms, General Dynamics identified Tadiran as best meeting those needs for the SINGARS program.



**Inside Job.** Richard J. Emrick, a missile mechanic at Convair, adjusts a mechanism in the final assembly of a Tomahawk cruise missile tail cone. The cone houses the engine that powers the missile and the fins that control it.

## As the Unofficial 'Spokesman' at Fort Worth, Nick B. Esquivel Keeps 2,800 Wheels Spinning

Fort Worth employee Nick B. Esquivel is sometimes called the F-16 factory's chief "spokesman."

Esquivel makes all necessary repairs and adjustments on approximately 1,400 bicycles at the division that employees use to run errands, transfer small parts and move between widely separated departments on the mile-long assembly line and 602-acre main plant property.

"Bicycles are a cheap mode of transportation, and pretty reliable," Esquivel said. "We get good bicycles and we take care of them. Some of the bikes have been here since the early 1940s, but they're still going strong."

In addition to performing routine maintenance and fixing flats and spokes, Esquivel sandblasts and repaints old bikes to make them look like new.

He joined the division nine years ago as a mechanic in the Transportation Department. He moved into his present job after the previous bicycle repairman retired.

"We work on a little of everything in the division garage — sweepers, mowers, forklifts, cars and trucks," he said. "But I think I have the best job. I like bicycles."

Esquivel said he receives about 15 bicycles a day that need repairs. Some are walked in. Others arrive by truck. He meets a lot of different people in his job, which also involves a certain amount of diplomacy and public relations, he said.

"For example, I know one person on the second shift who's been riding the same bike here for 30 years," he said. "He doesn't want anybody messing with it. If its bearings

wear out, or if it has a flat, he has to use a loaner until I can get it back to him, and he doesn't like that."



**Chief Spokesman.** Fort Worth's Nick B. Esquivel works on one of the 1,400 bicycles that he maintains.



## Stinger Production In Europe Approved For NATO Group

The U.S. Government has granted the Stinger Project Group (SPG), a cooperative program among several North Atlantic Treaty Organization (NATO) countries, a license to produce the Stinger missile in Europe by year's end.

The European production program will mean increased business and income for Valley Systems Division, which produces Stinger, according to William M. Leonard, Division Vice President and Program Director-Stinger Weapon Systems.

Leonard said the division will fabricate and install all test equipment required by the European partners, furnish key missile hardware through foreign military sales procedures and provide significant technical assistance to enable timely start-up of the SPG production line.

He said the SPG work will not affect the division's production of Stinger because of current Valley Systems contracts. Under these contracts with the U.S. Army Missile Command (MICOM), Valley Systems will produce more than 20,000 Stinger-RMP (Reprogrammable Micro-processor) rounds through December 1991.

Through an agreement with MICOM, the division will receive a license fee before the start of European production.

The SPG production Memorandum of Understanding (MOU) has been ratified by the parliaments of the Federal Republic of Germany, the lead country, and the Netherlands and Turkey, but it is still subject to ratification by Greece.

While production is scheduled to begin in Europe by the end of the year, Valley Systems' involvement began in September with the test equipment fabrication effort. Final assembly will be performed by Dornier GmbH, the prime contractor, in the Federal Republic of Germany. Major subcontractors from each SPG country will assist Dornier.

Of the 18 military items initially offered by the U.S. Government in the late 1970s to NATO member countries for European production, only Stinger was chosen. The offer was made to demonstrate U.S. cooperation in weapons production and to seek commonality of weapons among the United States' European allies.

Valley Systems is supporting Dornier and selected potential subcontractors to the West German firm. This effort consists primarily of providing sufficient program understanding to permit the various European countries to submit credible proposals for their portion of the Stinger SPG production program. Support will continue until the full program go-ahead planned later this year.

## Company Is Selected For Excellence Award By Financial Analysts

General Dynamics has been given an Award for Excellence by the Financial Analysts Federation "in recognition of the superior efforts" the company has made in communicating financial strategies and results.

The company primarily was cited as having the best investor relations program of 11 companies in the aerospace industry.

In a preliminary 1987 report of the aerospace subcommittee of the federation's Corporation Information Committee, General Dynamics also was praised for its "well-organized annual and quarterly reports."

The subcommittee said General Dynamics' 1987 annual report was one of three top annual reports in the subcommittee survey.

The company's investor relations program moved into the top spot from seventh place in last year's survey.

One subcommittee member, according to the report, said, "The entire GD management team should get an A+ for financial relations."

## Atlas E Rocket Launches Weather Satellite To Continue Its String of Successes

By Julie C. Andrews

Boasting the longest-running string of successful launches in the world, a Space Systems Atlas E rocket added another one to the record on Sept. 24th. Atlas 63E boosted a weather satellite into perfect orbit from Vandenberg AFB, Calif., to extend its launch record to 18 consecutive successes.

The Atlas booster was originally manufactured and delivered to the U.S. Air Force as an intercontinental ballistic missile in 1961. It was placed in storage at Norton Air Force Base, Calif., in 1965 and shipped to Vandenberg in 1983 where it was refurbished for low-earth orbit missions.

The weather satellite launched for the National Oceanic and Atmospheric Administration (NOAA) is designated NOAA-11 and joins NOAA-9 and NOAA-10 spacecraft now in orbit in collecting meteorological and ocean data for transmission directly to users around the world. It will eventually replace the NOAA-9 spacecraft, which is nearing the end of its useful life. Both NOAA spacecraft were launched by Atlas.

From its 540-mile, sun-synchronous, near-polar orbit, NOAA-11 will circle the earth approximately every 102 minutes. The satellite will observe a different portion of the earth's surface on each orbit and view the earth's entire surface and cloud cover once every 12 hours.

In addition to assisting in global and local weather forecasting, data from the NOAA series of satellites are used for hurricane tracking and warning, ozone depletion studies and other scientific and industrial programs.

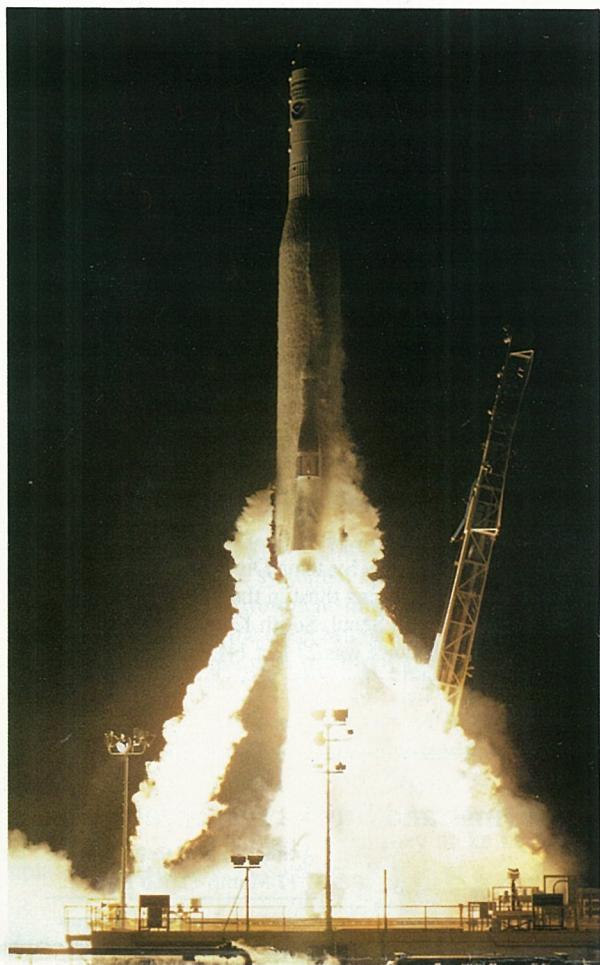
The satellite also carries an international search-and-rescue instrument on board. COSPAS/SARSAT is a satellite-aided search-and-rescue project of the United States, Canada, France and the Soviet Union. Its instrumentation, already operational on NOAA-9 and -10 and two Soviet satellites, relays distress signals transmitted from downed aircraft or vessels at sea to ground-sea-air recovery forces.

The "World Society of SATCATS" — composed of downed flyers and shipwrecked sailors who owe their lives to the life-saving satellites — held its first meeting at Vandenberg the week of the Atlas 63E launch. The group wants to help increase awareness of COSPAS/SARSAT use.

"We hope to save lives by enlisting hundreds more people throughout the world to join a SATCAT campaign for proper use of emergency radio beacons," said Dr. E.

Jeff Justis, temporary chairman of the group and a Memphis, Tenn., surgeon. Justis and his wife were rescued within six hours of a 1986 belly landing on the Greenland Ice Cap, thanks to COSPAS/SARSAT.

Since 1982, Atlas E has successfully launched four satellites in the Defense Meteorological Satellite Program, four NOAA weather satellites, four Navstar Global Positioning System satellites, one Geosat and five classified payloads. Atlas has flown 271 missions from Vandenberg since the first was launched in September 1959.



Atlas E Rocket Launches NOAA-11 Satellite

## Electric Boat Receives Its 16th Trident Contract As Navy Makes Second Trident Award This Year

The U.S. Navy announced Oct. 5th that Electric Boat had been awarded a \$617 million contract for the 16th Trident submarine.

This award marks the second Trident won by the division this year, the award for the 15th Trident having been made back in January, and represents the Navy's exercising of an option made at the time of the earlier bid.

Electric Boat's award in January came after an intense bidding process that for the first time included a competitor, Newport News Shipbuilding and Drydock Co. The division had submitted its bid for three submarines at the time, which means that the Navy could exercise Electric Boat's option on the 17th Trident submarine when that contract is awarded sometime next year.

Response to this latest contract award has been highly

positive. The Hon. Samuel Gejdenson, United States Representative from Connecticut whose district includes Groton, said that this contract is "particularly important because it drives the final nail into the coffin of those who argued for dual sourcing of Trident contracts." Since the proposed number of Tridents is only 20, Gejdenson also noted that it would be "practically impossible to bring in another Trident contractor at this stage."

The Hon. John H. Chafee, U.S. Senator from Rhode Island, said the contract is "a great testament to the management and workers at Electric Boat."

Rhode Island is home to Electric Boat's Quonset Point Facility, which manufactures hull components for submarines.

## GLCM Team Is Given 'Hap' Arnold Award At Air Force Association National Meeting

The Air Force Association's (AFA) highest military honor, the Gen. H.H. Arnold Award, was presented to the Air Force Ground Launched Cruise Missile Team in September at the association's national convention in Washington.

Convair Division produced 442 of the land-based, highly mobile GLCMs before the weapons were eliminated under the terms of the historic INF Treaty.

Gen. Larry D. Welch, Air Force Chief of Staff, accepted the award in behalf of the men and women "who produced, deployed and currently man the Ground Launched Cruise Missile." Welch said not only has the GLCM program been "extraordinarily challenging," but it has also been "uniquely successful."

The GLCM team, Welch added, "has made it possible to eliminate a Soviet threat of some 3,000 warheads without ever pulling the trigger. If all of our systems could

be that successful the world would indeed be a much more secure place to live and we owe those men and women a very special vote of thanks."

AFA National President Sam Keith said the men and women of the GLCM Team received the Arnold Award because of their "selfless dedication and significant contributions to our national defense."

"The deployment of GLCM and the skill of these outstanding individuals who have maintained and operated it have led directly to negotiations on the INF Treaty," Keith said. "They are on the front lines of deterrence and their extraordinary abilities are to be highly commended."

AFA's most prestigious award is named for five-star Gen. H. "Hap" Arnold, Commanding General of the Army Air Forces during World War II and AFA's founding father.





**Olympic Medalist.** Larry Myricks, Human Resources Representative at Valley Systems Division, captured a bronze medal by finishing third in the long jump at the Summer Olympics in Seoul, South Korea. Myricks' medal-winning distance was 27 feet 1¾ inches. It was his first Olympic medal in four tries as a member of the U.S. team.

Savings and Stock Investment Plans			
	Annual Rate of Return for the 12 Month Period Ending:		
	August 1986	August 1987	August 1988
<b>Salaried</b>			
Government Bonds	14.2%	4.6%	7.3%
Diversified Portfolio	39.6%	39.4%	(18.4)%
Fixed Income	12.1%	11.7%	10.9%
<b>Hourly</b>			
Government Bonds	13.6%	4.8%	7.5%
Diversified Portfolio	40.4%	41.4%	(18.8)%
Fixed Income	12.1%	11.7%	10.8%
<b>GD Stock Closing Price</b>	\$75.00	\$70.25	\$49.50
( ) Negative number			

## Fort Worth Is Cited For F-111 Upgrades

The U.S. Air Force Systems Command recently cited ongoing upgrades to the F-111 fleet as examples of the benefits offered by the Air Force's Reliability and Maintainability 2000 initiative.

The Air Force said avionics upgrades to its F-111s prove that "R&M 2000 really works."

The service is upgrading its FB-111As under an Avionics Modernization Program and its F-111Fs under the Bomb Navigation Systems upgrade. Fort Worth received contracts for both efforts. Specifications called for significant reliability improvements.

The upgraded FB-111As have already shown outstanding performance in weapons delivery competitions. "Successfully executing the R&M requirements felt great," the Air Force said. "Now, seeing 'our' aircraft show its stuff proves what AFSC's mission truly is: 'Provide the users with the best equipment possible.'"

GENERAL DYNAMICS

World

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# Current & Comment

*(Observations on news of interest to the company and the industry will appear regularly in this column.)*

**GOOD NEWS** — The red, white and blue went gold, silver and bronze in the long jump at the recent Olympics in Seoul, South Korea, thanks in part to a General Dynamics employee.

Larry Myricks (see photo in column at left), who spends his time running, jumping, lifting and, in general, moulding his body into sensational shape when not working as a Human Resources representative at Valley Systems Division, was one-third of the U.S. long jump triumvirate. Myricks minted a bronze medal with his best jump at Seoul, 27 feet 1¾ inches.

But Myricks' story goes far beyond his accomplishments at Seoul. He is an inspiration for everyone who's been down on their luck . . . and that includes just about all of us.

The Olympics have long been a source of high hopes that ultimately ended in bitter disappointments for Myricks. Favored to win the gold medal in the long jump in 1976, he broke a bone in his right ankle while warming up at the Olympic final in Montreal. He qualified for the U.S. team again in 1980, but the United States' boycott of the Games in Moscow robbed him of a second chance. At Los Angeles in 1984, Myricks missed a medal by finishing fourth.

Although at an age when the abilities of most world-class athletes are waning, Myricks elected to try a fourth time in 1988 when he would be 32 years old. General Dynamics gave him a big boost by granting him paid time off, beginning in March to train for another attempt at an Olympic medal.

"I'm really glad GD saw enough in me to do that," Myricks said before he left for Seoul. "I didn't have to worry about paying bills. It was really a big help."

Freed from financial headaches and work commitments, Myricks enjoyed a stellar summer. While becoming the first American to qualify for the Olympic long jump four times, he finished second in the U.S. trials in what *Sports Illustrated* called the greatest long-jump duel in history. He covered 28 feet 8¼ inches on his final try, only to be beaten by 1984 and eventual 1988 gold medalist Carl Lewis by ¾ of an inch on Lewis' last attempt.

Myricks is back on the job at Valley Systems. His athletic future? "It doesn't make any sense to retire now," he said.

Whether or not there's a fifth Olympics in Myricks' future, we send him our warmest congratulations for the success he finally forged after 12 trying years.

**MORE GOOD NEWS** — General Dynamics had a

hand in another excruciatingly difficult but successful comeback by an American performer, the space shuttle *Discovery*. The shuttle, which roared into orbit and returned from a near-flawless mission that began Sept. 29th and ended Oct. 3rd, deployed a satellite from a cargo bay that was built by Convair. Six of the cargo bays — known formally as midfuselage sections — were built in San Diego. Convair delivered *Discovery's* cargo bay on March 15, 1982, to Rockwell International, the prime contractor.

*Discovery's* recent flight has restored flagging faith in the U.S. space program. It had been 32 months since the last American attempt to put humans in space ended tragically when the shuttle *Challenger* exploded shortly after liftoff, killing its entire crew. Now, however, there's new support for the space station, an American return to the moon and a manned U.S. expedition to Mars. Space Systems Division will provide the AC power supply for the space station, and missions to the moon and Mars represent more opportunities for General Dynamics to participate in America's space program.

**AND NOW THE BAD NEWS** — The fledgling U.S. commercial launch industry took an undeserved kick in the shin from Uncle Sam recently when the government conditionally approved the use of China's Long March launch vehicles to boost three American-made satellites into orbit.

The OK for Long March is puzzling to an American commercial launch industry that was formed in the first place largely because of the government's encouragement. The government says the launch of U.S. satellites by Chinese boosters will enhance U.S.-China trade. But the issue is more than simply one of trade balance.

General Dynamics and other companies have invested heavily in research and development, facilities and capital equipment to offer commercial launch services. Meanwhile, China's ability to compete in our markets stems not from superior technology or quality, but from the nationalized support of the Chinese launch service. The Chinese government's subsidies to the industry enables the Chinese to price a launch from 50-65 percent less than equivalent U.S. flights.

There's also the issue of technology transfer. Should these satellites, which represent many years and many dollars of research, be handed over to a Communist nation with nothing more than a guarantee that the Chinese won't peek? A U.S. government team was to start negotiations with the Chinese the week of Oct. 17th. If these negotiations are completed successfully, it is expected that the spacecraft export license will be granted.

## Initiatives Aimed at Improved Competitiveness

A corporatewide set of initiatives has been developed that aims to improve competitiveness through improved materials management.

Called IMPACT 2000, for Implementing Positive and Competitive Teaming, the program was defined by division Material Vice Presidents dealing with these initiatives. It was presented by Monty Dickinson, Staff Vice President-Material, at a recent supplier conference in Fort Worth.

IMPACT 2000 is composed of 10 initiatives designed to improve General Dynamics and its supplier network material management techniques in the areas of cost, quality, schedule and overall management. The program's

main theme emphasizes closer teamwork between the divisions' material functions and suppliers.

According to Dickinson, IMPACT 2000 resulted from an intensive study of material management practices within each division and industry in general. General Dynamics focused on material management because purchased material represents more than half of the company's annual total costs. Since this area is so large, it presents a significant opportunity for substantial improvement and increased cost competitiveness for each division.

Complete implementation of the 10 points will occur before the end of 1989.

## Employees Lead the Way in 'Quality Month'

The Mayor of Fort Worth, Bob Bolen, proclaimed October "Quality Month" in the city as the result of efforts by General Dynamics employees in the local chapter of the American Society for Quality Control (ASQC).

D.J. "Jim" Talley, Fort Worth's Vice President-Quality Assurance, was keynote speaker at an ASQC dinner held to observe Quality Month.

"Quality is everyone's job, and it cannot be delegated to a single group within an organization," Talley said. "Amer-

ican industry's overseas competition has made it clear that every worker must be a quality inspector and that true quality begins with upfront product inception. Our key to success is to relearn that philosophy and to apply it as a nation."

Talley also praised ASQC members for promoting the quality profession in education and industry.

Congress established October as National Quality Month in 1984.



## F-16 Shows USAF, Army It Is Capable of Close Air Support Role By Joe Stout

The U.S. Air Force and U.S. Army demonstrated the F-16's capability to provide close air support (CAS) to ground forces in a recent seven-week trial at Nellis AFB, Nev., and Fort Hood, Tex.

Seven F-16Cs from various Tactical Air Command fighter squadrons were painted camouflage green and equipped with 30mm gun pods and PAVE PENNY laser spot tracking pods for the demonstration. Air Force CAS pilots also flew Fort Worth's technology demonstrator, F-16B No. 2, which was equipped with an Automatic Target Handoff System (ATHS), a digital terrain navigation system and two night forward looking infrared (FLIR) systems, Falcon Eye and Pathfinder.

"The evaluation showed that the F-16 is a very capable replacement option for the Air Force's current CAS aircraft, the A-10," said Thomas P. "Tuck" McAtee, Fort Worth's Manager of F-16 Model Improvements. "The big question was whether a fast-moving aircraft like the F-16 could find targets as well as the much slower A-10. The results of the demonstration were very positive."

"Evaluation missions showed that target cueing accuracy, not speed, was the important factor in target acquisition, and that a properly equipped Fighting Falcon is very effective in acquiring targets in the CAS environment," McAtee said.

The Air Force is considering a version of the F-16, designated the A-16, as one of several replacement options for the A-10.

The F-16s were employed in conjunction with an OV-10 forward air controller aircraft, an OH-58D scout helicopter and an Army mobile ground control unit. These vehicles were used to locate targets and transmit target coordinates to the F-16Cs via voice radio.

In the tests with F-16B No. 2, target locations were transmitted to the aircraft automatically via the ATHS digital data link. The ATHS was previously demonstrated with the Advanced Fighter Technology Integration/F-16 (AFTI/F-16) aircraft in a series of flights at Edwards AFB, Calif.

"The demonstration established the value of a data link in providing rapid, jam resistant, low-error targeting data directly to the aircraft's fire control system," McAtee said.

Outstanding navigational accuracy was demonstrated with F-16B No. 2's digital terrain system, McAtee said.



**Green Fighting Falcons.** Seven F-16Cs and F-16B No. 2 await flight orders on the Nellis AFB flight line during the Air Force's recent F-16 close air support demonstration. The aircraft were painted in green camouflage for missions simulating close air support of ground forces.

"Based on the assumption that accurate navigation is a key factor for CAS mission effectiveness, there appears to be a large potential for improvement by incorporating a digital terrain system, possibly with a moving map display, in the Air Force's next CAS vehicle," he said.

The digital terrain system used in the CAS demonstration was British Aerospace's terrain profile matching system. F-16B No. 2 was also used to demonstrate the Falcon Eye system, a turret-mounted infrared sensor that turns with the pilot's head as he looks out of the cockpit. Mounted to the nose of the aircraft in front of the canopy, the sensor provides a night view in any direction the pilot looks within the limits of its movement. The imagery is presented to the pilot on a head-mounted display, along with symbology normally provided on the F-16's fixed head-up display.

Pathfinder, a FLIR navigation pod system, was also tested in conjunction with Cat's Eyes light amplification goggles.

The PAVE PENNY laser spot tracker pod is a standard element of the current A-10 CAS configuration. PAVE

PENNY pods were mounted on the inlets of the F-16Cs.

In addition to the 30mm cannons pod-mounted on the aircraft centerline stores stations, the F-16s carried AGM-65 Maverick missiles and other air-to-ground weapons in the missions. Antiarmor attacks and attacks against multiple small, moving targets are characteristic of the CAS mission, McAtee said.

The first five weeks of the evaluation at Nellis AFB included tests in the presence of radar threats emanated by simulated Soviet radar systems. The Fort Hood phase provided a ground environment more closely resembling Western Europe than the desert ranges at Nellis.

The evaluation pilots were familiar with the CAS mission through A-10 experience. Two had completed their F-16 flight training only weeks before the demonstration.

"The pilots were satisfied that the F-16 has the potential to be an effective CAS aircraft," McAtee said.

The demonstration results will be among data considered by Air Force officials when they make key A-10 replacement decisions, he said.

## Air Defense Planning Tools Used by U.S. Marines in War Game By Julie C. Andrews

Air defense planning tools being developed at Electronics Division got a workout in the field on the side of the U.S. Marines during this year's Army/Marines "Gallant Eagle" exercise.

Alpha and Bravo batteries of the Marines' 3rd LAAD (Low-Altitude Air Defense) Battalion used Electronics' Air Defense Artillery Planning Tool (ADAPT) to optimize the placement of their Stinger teams as they defended their terrain against Army attackers near Twentynine Palms, Calif. Gallant Eagle involved military personnel from the 7th Marine Regiment, the Army's 7th Infantry Division and the 82nd Airborne Division.

"The Marines have been developing requirements for command and control of short-range air defense weapon systems under a program called LAAD-C2," said Wayne L. Poage, Program Manager of C3 Programs at Electronics. "We are working on expert systems with LAAD mission planning applications as well as command and control applications."

Under company-funded research, expert system development is being led by Jon T. Hujsak, Principal Investigator in the division's new artificial intelligence laboratory.

In the months before Gallant Eagle, Marines from Quantico Development and Education Command visited Electronics, along with Marines from the 3rd LAAD Battalion at Camp Pendleton, the large Marine Corps base north of San Diego, to explore the use of Electronics' air defense command and control tools for Gallant Eagle.

Personnel from the 3rd LAAD Battalion worked with Electronics software engineers and provided them with

valuable input on Marine air defense operating procedures. Electronics then developed the software to analyze threat and terrain data to produce computer-generated map overlays used during Gallant Eagle to show the line-of-sight of all Stinger teams in the terrain, their nominal target acquisition ranges and lethality envelopes.

"In preparing for the exercise, we benefited from the Marines' input about the rules of engagement so we had a better idea of what should go into the reasoning module of the expert system," Poage said.

Previously, mission planning in the field consisted of a platoon leader using paper field maps to determine weapon positions based on the best knowledge of terrain and area. "It's hard to plan effective weapon placement with a paper map — it can result in serious holes in the overall coverage," Poage explained.

In an early test of its system, Electronics software engineers simulated air defenses of a dam near San Diego. Without expert system planning tools, the dam was left unprotected because of a valley leading directly to the dam from across the reservoir, a route that was not readily discernible from paper topographic maps.

Electronics is working on the basic modules that are part of an overall command and control expert system called Intelligent Tactical Air Defense (ITAD), still largely laboratory-based. Air defense weapon positioning of the kind that took place during Gallant Eagle is an early stage of ITAD. Eventually, ITAD will also incorporate local sensor data to get the best local air picture and computer-based decision-making to assign targets to weapons.



**Jon Hujsak, Wayne Poage and Software Engineer Valerie Lipman Look Over Map Overlays Used in Gallant Eagle Exercise**

Electronics followed up on its Gallant Eagle participation with an interactive display at the Marine Corps League show in Washington. Attendees at the display were invited to determine weapon placement looking at the Twentynine Palms paper topographic maps. Then Electronics personnel generated the map overlays to "grade" the decisions.

## Dutch Firm Orders 10 More Caravan IIs for Its European Operations

Aviation Lease Holland B.V. has ordered 10 more Cessna Caravan II cargo aircraft, increasing its fleet of Caravans to 28.

Martin Duijvestijn, Managing Director of Aviation Lease Holland, said his company will take delivery of the 10 aircraft between January and November of 1989. He said the Caravan IIs will join the 18 previously delivered aircraft as cargo haulers throughout Europe.

The Aviation Lease Holland fleet of Caravan IIs is the largest fleet of Cessna multiengine aircraft ever ordered by one company.

Duijvestijn said his company will lease the aircraft, with or without crew and maintenance service, to operators in any European country. The aircraft will be maintained by Aviation Technics at Teuge Airport in Holland.

The Dutch company and an associate company, Air Finance Holland, have been flying Caravan IIs since 1986. The big cargo turboprops are operating in seven European countries — England, Ireland, Holland, Belgium, Germany, Switzerland and Portugal.

In addition to the all-cargo version, the Caravan II can be configured with up to 12 commuter passenger seats, or

as an eight-passenger executive aircraft.

The turboprop twin is powered by Pratt & Whitney PT6A-112 engines rated at 500 shaft horsepower and has a maximum cruise speed of 246 knots (283 mph). The aircraft's base price is \$1.395 million.

The Caravan II is assembled in France by Cessna's associate company, Reims Aviation, S.A. The aircraft is also in service with the French Customs Service and the French Army, performing a variety of special missions, including maritime surveillance and target towing.



## Navajo Tribe Is Building a Valley Systems Plant in New Mexico By Jerry Littman

Construction has started on Valley Systems Division's electronics assembly plant in the Navajo Agricultural Products Industry Industrial Park near Farmington, N.M. The facility is being built by the Navajo Tribe and will be leased by General Dynamics for 15 years.

Construction is expected to be completed next July when 150-200 Navajos will be hired to produce components for both Stinger and RAM (Rolling Airframe Missile).

At the recent ground-breaking ceremony, Leonard M. Stuessel, Division Vice President-Production, said, "This new facility reflects the need for electronics assemblies for our present programs and the growth we expect."

He added that the plant "will make a significant financial impact on the local economy . . . through payrolls, purchase of materials, local services, employee skills development using the local community college and a solid long-term employment base."

Stuessel cited the success of Pomona's facility on the Navajo Reservation at Fort Defiance, Ariz., as one of the reasons for the selection of the site near Farmington. He complimented Navajo workers for their reliability, competence and skilled craftsmanship.

Peter MacDonald, Chairman of the Navajo Tribe, said the event marked "the special partnership the Navajo Nation has with General Dynamics. This new facility will help establish the visions we have of the economic future of the Navajo, as a leader going into the 21st century."



**Symbolic Turning-of-the-Earth.** At the ground-breaking ceremony for Valley Systems Division's facility on Navajo Tribal Lands near Farmington, N.M., representatives of the division, the Navajo Tribe and local governments turn over the earth to begin construction. Participants included Leonard M. Stuessel (fifth from left), Valley Systems Division Vice President-Production, and Peter MacDonald (fifth from right), Chairman of the Tribe. When the project is completed in July 1989, Navajo employees will produce components for Stinger and RAM.

## Quonset Point Finishing Center Is Dedicated to Its Employees By Richard A. Boudreau

The dedication of the new Finishing Center at Electric Boat's Quonset Point Facility had an unusual twist. It was dedicated to the employees who work there.

Special guests at the recent ceremony were the men and women of the Blast and Paint Department who staff the new center.

William W. Bennett, Division Vice President and Quonset Point General Manager, told the employees:

"We are dedicating this building to you. We salute you for keeping our product line going, even under extreme conditions. May this building serve you well."

The 33,000-square-foot state-of-the-art building is the third major addition to the Quonset Point Facility since it opened in 1974. The \$9.9 million facility replaces the old Blast and Paint Building, which once served as an aircraft hangar for the Quonset Point Naval Air Station.

The new center features four work cells for blasting and painting submarine hull components and is designed to

handle the largest submarine hull cylinder sections manufactured at Quonset Point. Quonset Point makes major components for the U.S. Navy's Trident ballistic missile-firing submarines and 688-class fast-attack submarines.

Roger E. Cournoyer, Facility Manager of Operations, said: "It is a very unique structure. We have a new facility that we can all be proud of, one that has the latest operational capabilities, one that will reduce product cost and improve quality."

Maurici P. Jorge, Facility Operator, opened the ceremonies with the national anthem. Painter/Mechanics Harold E. Lyons and Clarence J. Berard, the senior department members, unveiled the new Finishing Center sign. Six other senior members of the department, also painter/mechanics — Robert L. Asciolla, Charles A. Alvernaz, Samuel A. Manchester, George W. Mancinho, Richard N. Doucette and Norman G. Gosselin — performed the ribbon cutting ceremony.



**Official Opening.** Six senior employees of Department 924 at the Quonset Point Facility — Robert L. Asciolla, Charles A. Alvernaz, Samuel A. Manchester, George W. Mancinho, Richard N. Doucette and Norman G. Gosselin — cut the ribbon to mark the official opening of the Facility's new Finishing Center.

## Land Systems' Lima Plant Celebrates Its 10th Anniversary By Donald L. Gilleland

Land Systems, United Auto Workers and U.S. Army officials celebrated the 10th anniversary of the Lima Army Tank Plant (LATP) on Oct. 7th.

The plant, which builds all the hulls and turrets, assembles 50 percent of M1A1 Abrams main battle tanks. The other parts are assembled at Detroit Arsenal Tank Plant. In 1988, Lima produced the hull for the first derivative of the Abrams tank, the Improved Recovery Vehicle that the U.S. Army is evaluating in a competition for a new vehicle to help recover and repair battle-damaged tanks.

In ceremonies marking the anniversary, a street at the plant was named in honor of the late Maj. Gen. Duard D. Ball, a key supporter of the Abrams. Each Lima employee received a brass medallion as a souvenir, and those employees who have worked at the plant since its opening were recognized at a special dinner-dance Oct. 8th.

"Much of the credit for the well-being of the Abrams program today belongs to Maj. Gen. Duard D. Ball, Program Manager for the M1 Abrams Tank system from 1980 to 1983," said Lt. Col. John B. Scarfo, LATP Plant Commander, in his opening remarks.

Added Plant Manager Galdino Salvador: "The belief and confidence that Major General Ball had in the all-new tank, with its turbine engine, has come to fruition in this our 10th year of producing the Abrams tank family."

Proud officials and employees repeatedly credited teamwork for the plant's success. "I like to think of us as a team," said Darrell Cole, President of UAW Local 2075, "a team made up of the Army, the UAW and General Dynamics — an unbeatable team in preparation of defense for our country."

The government-owned, contractor-operated facility employs nearly 2,800 workers. Operated by Chrysler Defense, Inc., when it opened in 1978, Lima had about 380 employees. The work force grew to nearly 4,000 during peak production in 1986-87. Employment fell in 1988 with a decline in tanks orders from the Army.

General Dynamics bought Chrysler Defense, Inc., in 1982 and renamed it Land Systems Division.

The Lima plant started production in 1978 with an initial order for two prototype XM1 tanks to be built by 1980. The initial order was followed by a contract to build 110 more tanks. Since then, nearly 3,000 Abrams tanks have rolled off the production line.

Tank production at Lima improved significantly as Land Systems installed the latest manufacturing technol-

ogies and expanded the facility to more than 1.6 million square feet. The plant's expansion enables it to accommodate regular production of 70 tanks per month and a surge capacity of 120 tanks per month.

In 1987 Land Systems won a \$3.5 billion multiyear contract to build up to 3,299 M1A1 tanks, which will keep Lima employees building tanks through at least 1991.



**Lima Anniversary.** Galdino Salvador, LATP Plant Manager, speaks to more than 200 employees and guests during ceremonies in Lima, Ohio, marking the plant's 10th anniversary on Oct. 7th. Also on the platform are (left to right) Lt. Col. John Scarfo, LATP Plant Commander; Col. George Telenko, LATP Plant Commander in 1978; Darrell Cole, President of UAW Local 1075; and Robert Schwalm, Vice President - Manufacturing.



## Her Passion for Music Pervades the Life of Lisa Floyd-Peterson By Larry Elwell

"I'm singing to the heavens" is the way Lisa Floyd-Peterson describes her passion for her music.

The passion of Floyd-Peterson, a 31-year-old secretary at Pomona, is evident in every part of her life, but it is in her music that every facet of her life's journey folds into one.

"If you let me choose a set of songs, I will sing you the story of my life," she said. "In all of my music, I have a message, and that message comes from the experiences I've had."

"The strongest message that comes through me is about the short time we have on this earth with each other and that we should cherish the time we have," she said. "My father loved to hear me sing, but he died when I was 12. Since then I have been singing to him in the heavens."

Floyd-Peterson said she leans toward ballads in her singing because the emphasis is placed upon the song's meaning and not its melody.

"In my ballads, as well as in all my pieces, the title and lyrics are 90 percent of the song," she said.

Emotion in her songs is the life-blood of Floyd-Peterson's personality. "Singers often speak for those who can't, and if you look at the most serious artists, they relate to so many people because they are giving a part of themselves to everyone," she said.

Floyd-Peterson's passion, however, is not fettered to a post of pensiveness. When she leaves her job each night, her world transforms from the fast-paced business at Pomona to that of a singer-songwriter on the verge of her first big break.

Since moving to California, she has created her own recording label and hired a long-time songwriter and producer, Troy Laws.

"My husband and I came out here because he had a back injury and needed treatment from a medical school in this area," Floyd-Peterson said. "By luck a friend introduced me to Troy, and we started working every weekend until my first album was cut."

Floyd-Peterson's first album, "Melody in Gray," has



**Floyd-Peterson Listens to a Recently Recorded Album**

sold more than 1,500 copies, mostly on the East Coast near her home town of Washington, D.C. The major single off the record, "You Can't See the Love For the Trees," is receiving air play in major markets on both coasts.

"The music on my album is a progressive mix of jazz, pop and rhythm and blues," she said. "I am most comfortable with this music because all of the songs that have meant so much to me, both as a performer and listener, come from these musical styles."

The success of her album and her recording company has shown Floyd-Peterson that the business of making music can be overwhelming.

"I am not only a recording artist but I am also vice president of my own company," she said. "As a result, I have to audition bands, run a budget and book new shows and all the while find time to write new songs."

Studying under jazz great Nancy Wilson has been a highlight for her. The class at a local university was open to anyone. However, all students had to audition for the class.

"There were about 50 students in the class," Floyd-Peterson said, "and I was fortunate enough to be one of the 20 to sing and receive personal attention and critiques from Nancy."

"But Nancy did more than give us singing lessons," Floyd-Peterson said. "She told us what we needed to know about surviving in the music business. She wanted us to realize that this business is not always glamorous and that there is a lot of hard work involved."

But the work is not new to her. Even though her first record is only several months old, Floyd-Peterson is working on her next album and plans to be back in the studio around Christmas.

"Nancy, who has released 52 albums in 25 years, told me that you must always give the public something new or they will forget you," she said.

Floyd-Peterson started singing when she was five years old. At 12 she ventured to Africa with the Afro-American Gospel Choir and later performed classical vocals with various orchestras in the Baltimore area.

She has support at home and at work, which has sustained her through the beginnings of her musical career.

"When my album was released, one of the reasons I went back east with it is because I already had a lot of support, especially from my family," she said. "Currently, many people throughout the division ask me how my music is doing. In fact, I have even signed a few autographs."

## U.S. Army Team Praises Land Systems for Its Progress Since 1986 Audit

An Army Materiel Command review team assessing the M1A1 Abrams program praised Land Systems during the team's briefing.

The Acquisition Improvement Review (AIR) team visited every functional department at the Central Office Complex and observed applied practices and procedures at the Detroit Arsenal Tank Plant, the Lima Army Tank Plant and the Sterling Plant.

During the briefing, Art Nordstrom, AIR technical lead, spoke of the significant progress made since the 1986 audit. He complimented Land Systems' management for the many improvements made in meeting and exceeding delivery schedules, reducing costs and emphasizing value engineering and management of government-furnished materials.

Nordstrom cited the Land Systems supplier base, more than half of which provide 100 percent acceptable components at receiving.

The significant reduction in waivers and deviations and

the cell approach to change processing were lauded. The AIR team also noted initiatives by Land Systems to develop policies and procedures for management of weapons systems software even though military software development at Land Systems is in its infancy.

Nordstrom displayed graphics showing production efficiency increases with reduced scrap, repair and rework. Improvements in direct labor hours per unit, reduced overtime and falling labor costs were cited.

"Overall production performance is very much improved over 1986," Nordstrom said. He added that materials management has improved to the extent that part shortages are all but nonexistent at point of use.

He praised every department visited. He also cited the joint Army-Tank Programs approach to problem solving at informal cooperative meetings and Land Systems' innovative management programs of conducting semi-annual reviews for contractor and government suppliers. The reviews "ensure a continuous awareness of Abrams

status, issues and program direction," he said.

Nordstrom said he was impressed with the use of the corporate program to improve communication with all employees.

The team's draft report contains all of Nordstrom's complimentary remarks and includes 14 findings with recommended actions. All of the findings and actions are also upbeat. A majority require government disposition; the rest must be resolved by GDLS.

Robert Truxell, Vice President and Land Systems General Manager, thanked Nordstrom for the team's professionalism and thoroughness but said that he wasn't surprised the AIR team found significant improvement in the way GDLS conducts its work. "We have top-notch people," he said. "From senior managers to people on the production lines, they've worked very hard and very smart. A combination like that guarantees strides in efficiency and effectiveness."

## World War II Plant Manager Finds Many Memories at Fort Worth By Joe Stout

The F-16 factory was remembered as the "Bomber Plant" recently when George J. Newman returned for the first time since he retired from Consolidated Vultee Aircraft Corporation more than 40 years ago.

Newman, General Manager of the Fort Worth plant from 1942 to 1944, was responsible for the facility in the World War II years when it churned out as many as 175 B-24 Liberators a month. "It wasn't an easy schedule to meet," he said. "We had two regular shifts and a graveyard shift, and everybody worked very hard."

That was also the era of "Rosie the Riveter," when about 65 percent of the production force was composed of wives, daughters and sisters of servicemen.

During his visit, Newman toured the factory, sometimes called "the factory of the future," and met with Vice President and Fort Worth General Manager Charles A. Anderson. He was particularly interested in robots and other advanced equipment.

Newman said the facility looks drastically different, although some things have stayed the same, such as the presence of American flags. Large flags were displayed on the walls parallel to the B-24 assembly line during World War II. Today, more than 100 flags fly in the mile-long plant.

Newman said he worked for Consolidated Aircraft in Buffalo, N.Y., and in San Diego before moving to Fort Worth to help set up a factory to assemble flying boats.

Consolidated originally planned to test PBV aircraft on nearby Lake Worth, but it never built seaplanes in Texas, he said.

Newman's father, also named George, was an early associate of Maj. Reuben H. Fleet, the founder of Consolidated Aircraft. The senior Newman had owned a bicycle shop in England and immigrated to the United States to become an aircraft builder through acquaintance with the Wright Brothers, Newman said.

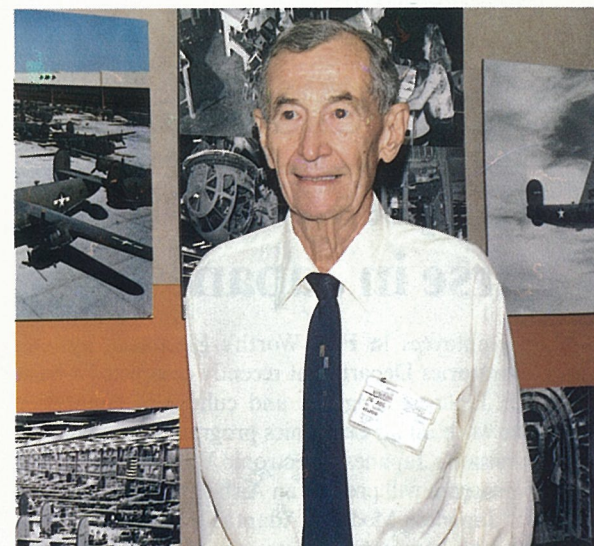
His father worked with aviation pioneer Glenn Curtiss and later with Fleet as factory manager at one of General Dynamics' earliest predecessor companies, Gallaudet Aircraft. Consolidated was founded when Fleet combined Gallaudet and Dayton-Wright Aircraft in 1923.

"My father knew a lot about strong, light materials from his experience with bicycles," Newman explained. "It was a natural thing for him to get together with Reuben Fleet and start building airplanes."

Newman said he was the 11th employee to join Consolidated Aircraft, as indicated by his company badge, No. 11. He was a pilot and participated in several first flights of Consolidated products, including versions of the PBV and Liberator.

The former general manager said he was pleased to see that Fort Worth has fared well in its transformation from Bomber Plant to fighter factory. "Visiting the factory was

a wonderful experience," he said. "The facility has made great strides."



**Scenes from Yesterday.** George J. Newman, Fort Worth's General Manager in the early 1940s, with photographs of the facility in its days as a B-24 Liberator plant. Newman had formerly worked for Consolidated Aircraft in Buffalo, N.Y., and San Diego.



## Three Fort Worth Employees Praised In Security Report

The federal Defense Investigative Service recognized three Fort Worth employees for "exhibiting outstanding security awareness and knowledge" following the agency's recent comprehensive security inspection at the division.

In their final inspection report, the investigators specifically praised the cooperation they received from Sherri N. Ray of Research & Engineering Administration, Rhonda F. Richey of the National Aero-Space Plane (NASP) program and Susan K. Kalkofen of Industrial Security.

The division's overall security was rated satisfactory in the semiannual inspection.

William I. Ferrier, Corporate Security Director, complimented the division's performance in a letter to Dennis A. Chesshir, Fort Worth's Director of Industrial Security. Ferrier said the division's almost perfect security report was an outstanding achievement "considering the size and complexity of the division and its extensive involvement in classified programs." He added that the division's performance is "in keeping with this company's commitment to security excellence."

## Thomas E. Dennis Is Named Top Buyer For Small Businesses

Thomas E. (Tim) Dennis, Senior Buyer at Fort Worth, has been named the winner of the company's 1987 Minority Business Award.

Monty W. Dickinson, Staff Vice President-Material, said that Dennis placed \$1,008,343 or 13 percent of his total procurement, with small disadvantaged businesses in 1987. Dickinson said that Dennis consistently had at least one, and often multiple, small disadvantaged firms receive his competitive bid packages. Fort Worth has more than 150 buyers in its procurement department.

Ted Allen, Fort Worth Small Business Liaison Officer, praised Dennis for his "perseverance and innovativeness demonstrated in interfacing with Engineering, Quality Assurance and other departments outside of Procurement."

Nominees from throughout the corporation were rated on their initiatives, perseverance, special assistance and outreach efforts to small disadvantaged business concerns.



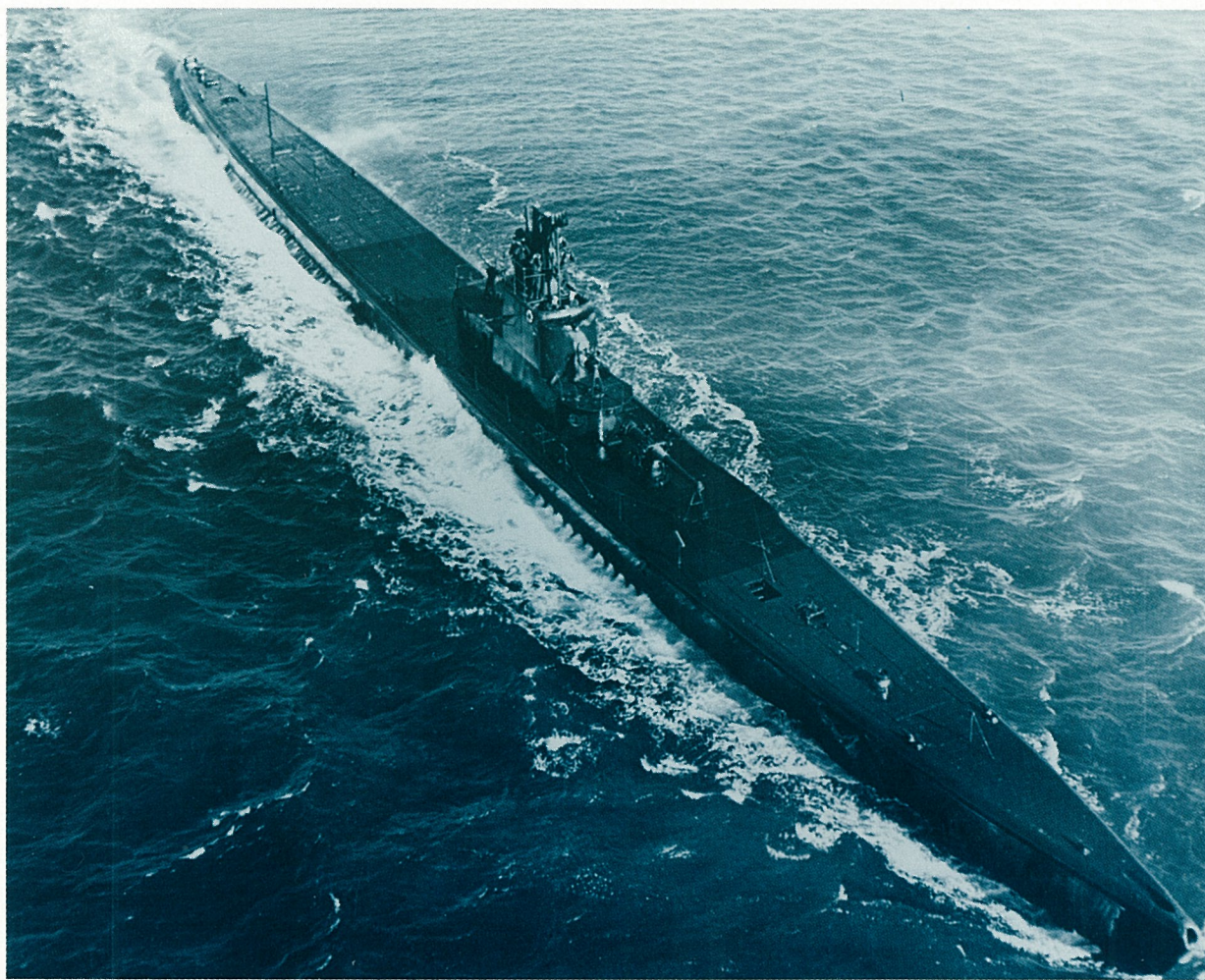
**Top Small Business Buyer.** Monty W. Dickinson, Staff Vice President-Material (left), congratulates Fort Worth's Thomas E. (Tim) Dennis for his award.

## Employees Complete Course in Japanese

Eight employees in Fort Worth's Electronic Systems and Laboratories Department recently completed a basic course in Japanese language and culture in connection with their work on an electronics program for Japan.

The division's Japanese Electronic Warfare Evaluation Facility program will provide an Airborne Intercept simulator and Japanese Modular Adaptable Radar System to Japan under a commercial contract with Fujitsu, Ltd.

The 12-week course was taught after work hours by outside instructors. The students learned a working vocabulary of useful Japanese words and phrases, basic Japanese grammar and sentence structure and correct pronunciation.



Electric Boat-Built *Flasher*, Which Was Launched on June 20, 1943, Was a Devastating Weapon in World War II

## General Dynamics Flashback

## Flasher Sank Most Tonnage in WWII By Myron R. Holtzman

Her active service spanned only 2½ years, but during that time USS *Flasher* (SS 249) became one of the most celebrated submarines in the annals of the Pacific campaign during World War II.

Commissioned Sept. 25, 1943, from Electric Boat's "Victory Yard," an auxiliary shipyard established to meet increased production demand, *Flasher* proved to be a fearsome sea weapon. She sailed under two commanders, Reuben T. Whitaker and George W. Grider, sinking 21 Japanese ships and leaving 100,231 tons of Japanese wreckage on the ocean floor, the most tonnage claimed by any submarine in the American fleet.

Today, the conning tower of *Flasher* sits at the National Submarine Memorial in Groton, Conn., where her sail is being restored through a community effort. The project is headed by Electric Boat, which delivered 74 submarines to the Navy during World War II — more than any other shipyard in the country.

The city of Groton, a local welding supply company and Electric Boat are supplying tools, while students from Ella T. Grasso Southeastern Regional Vocational Technical School are making structural and electrical improvements as part of their hands-on training. Meanwhile, a local garage has donated a storage area to house equipment and materials during the restoration.

*Flasher* was decommissioned and placed in reserve on March 16, 1946, ending an era of historic World War II sea battles against the Japanese. She completed six war patrols, each as dangerous and productive as the next.

The newly commissioned submarine entered her first war patrol in January 1944 under Whitaker's command. On its way to Manila from Fremantle, an Australian submarine port, *Flasher* found its first target, a 3,000-ton ex-gunboat near Marcus Island. The first torpedo fired from *Flasher*'s tubes sank the Japanese ship, an indication of things to come from the submarine. Whitaker and his crew went on to sink a freighter and two cargo ships off the Philippine coast, giving *Flasher* four ships for 10,528 tons on Whitaker's first patrol.

Action-bound once more in April, *Flasher* patrolled the coast of French Indochina, contacting a river gunboat guarding a freighter off Hon Doi Islands. Because the Japanese had little or no sonar detection system, *Flasher* sank both easily, then went on to send a large cargo ship to the bottom of the Sulu Sea before heading back to port.

In June 1944, the submarine became a member of the Navy's first formal wolf pack, along with USS *Creville* and USS *Angler*. Whitaker, the senior skipper of the group, commanded the pack. Leaving port ahead of the other two ships, *Flasher* traveled along the southern coast of Borneo and reached the equator, directly on the Surabaya-Singapore traffic lanes where Whitaker contacted a 13-ship Japanese convoy.

While waiting for the other two submarines to arrive, he fired six torpedoes at two freighters, hitting both. However, records listed only one sinking — the 6,000-ton *Nippo Maru*. Two weeks later *Flasher* sank another freighter, the 3,500-ton *Koto Maru*.

After the other two submarines joined *Flasher* a week later, another sighting produced more success when Whitaker's crew sank the light cruiser *Oi*, 5,700 tons, but not until outmaneuvering an accompanying Japanese destroyer, which unloaded 28 depth charges on *Flasher*.

In all, the pack had done well on its first mission. *Flasher* had 4½ confirmed hits, sharing one with *Creville*, for 25,000 tons. As a whole, the pack got six ships for 36,000 tons.

On its fourth patrol in September 1944, *Flasher* again had to survive a severe depth-charge attack but finally sank the 5,350-ton *Saigon Maru*. It proved to be the final patrol the mentally-fatigued Whitaker would assume. By December, Grider, moving up from serving as executive officer on another ship, was in command of *Flasher*.

On Grider's first tour 200 miles west of Mindoro in the South China Sea, he encountered a westbound convoy. Later, Grider wrote: "I stood in the quiet conning tower, feeling the rush of blood to my skin, knowing the test I had dreamed and wondered and worried about since my earliest days at the Naval Academy was upon me at last. My day of command in combat had arrived. What would I do with it?"

His fears didn't last long. He fired four torpedoes at a destroyer and felt two hits, explaining, "As I swung the scope to look, a feeling of exaltation like nothing I had ever experienced before swept over me. By heaven, I had paid my way as a skipper now, no matter what happened." The destroyer sank.

He didn't have time to enjoy his success, turning his attention to a tanker. He fired two torpedoes, and, as he dove from another oncoming destroyer, he heard two timed hits. Upon surfacing to periscope level he discovered — incredibly — that not only did he sink the tanker, but the accompanying destroyer also lay motionless in the water. He moved in and sank the destroyer.

Several weeks later, while guarding the Camranh Bay entrance, Grider made one of the most daring attacks of the war. He spotted a convoy and gave chase. When it proved impossible to get past the tankers' escorts from the seaward side, he eased *Flasher* into shallow water between the convoy and shore. He fired at three tankers, sinking all three. Thus, in his first patrol, Grider had sunk six ships — two destroyers and four large tankers, for 42,800 tons — for the third best patrol of the war.

*Flasher*'s final patrol came in February 1945 near Singapore. Grider sank a small freighter, giving *Flasher* the record for Japanese tonnage sunk by a single U.S. submarine — 100,231 tons.

*Flasher* received the Presidential Unit Citation for her brilliantly successful third, fourth and fifth war patrols. For her six war patrols, each designated "successful," *Flasher* also received six battle stars.



## Hoppie Alexander Knows the Right Words and How to Say Them By Joe Stout

Fort Worth's Hoppie Alexander has strong convictions about two things when talking about an individual's potential for success: attitude and ability to communicate.

He put his feelings into action recently when he delivered a stirring speech to an audience of 2,200 people and made a strong showing in the "World Championship of Public Speaking," sponsored by Toastmasters International in Washington, D.C. His speech, "The Winning Edge," told how attitude can make a difference as a person strives for achievement in personal and professional life.

To qualify for the international contest, Alexander demonstrated his communications ability by winning "best speaker" titles at the club, area, division, district and regional levels of the Toastmasters organization. The regional contest was held in June in El Paso, Tex., where Alexander represented 166 Toastmasters clubs in northeast Texas and northwest Louisiana.

Alexander relies heavily on communications skills as associate ombudsman in Fort Worth's Equal Employment Opportunity office.

His feelings about attitude are straightforward. "I believe that a person's attitude is more important than his or her abilities and even more important than opportunities," he said. "Attitude makes all the difference in the world. Attitude, not aptitude, will determine one's altitude. How high we fly will depend on how hard we try."

In the contest, Alexander stressed his message by effectively using voice inflection, gestures, eye contact and vocabulary — public speaking skills he has developed as a Toastmaster. He used particular emphasis in telling the story of Tom Courtney, a gold medal winner at the 1956 Olympics.

Courtney barely qualified for the 800-meter race but took the lead and won — despite falling in the last 50 meters — by repeatedly telling himself, "I want to win, I want to win," and using that strong desire to propel himself to victory," Alexander said.

In addition to relating others' achievements against difficult odds, Alexander's experience substantiates his



Hoppie Alexander with District Speaking Contest Trophy

message about attitude and perseverance. He is a native of Gresham, Tex., a farming community where his high school graduating class totaled 28 students. He came from a large, poor family and worked full-time as a cook, making 64 cents an hour, to put himself through college, he said. "I walked to and from work to save enough money to ride a bus to school," he said.

His junior and senior college years were separated while he served as a combat medic in Vietnam. He received a Bachelor of Science degree at the University of Texas at

Arlington.

Alexander joined General Dynamics 16 years ago as an hourly employee in Fabrication and has also worked in Tool Control, as a supervisor in Fabrication, as a Manufacturing Support Engineer and supervisor in Manufacturing Support Equipment, and as a management intern in Labor Relations. He has been in his present position in Equal Employment Opportunity since late 1986.

Alexander said he was inspired to become an accomplished public speaker by an experience at his eighth-grade graduation ceremony. "The event was in a gymnasium on a hot day with high humidity, and there were no fans or air conditioners to give the building ventilation," he said. "The featured speaker was an otherwise knowledgeable gentleman who loved the sound of his voice, and he just droned on and on, putting most of the people to sleep in the sweltering heat."

"I decided, at that moment, that if I were ever going to speak to people, I was going to try to make them listen," he said. "I decided that if I speak, you may not listen, but you will not sleep."

Alexander has been making speeches in one of Fort Worth's 22 lunchtime Toastmasters groups for about two years. He has also been a speaker for groups in several cities in north Texas and speaks occasionally at church functions.

He has carried his motivational message to local schools on several occasions, representing the company as a speaker at Career Days, Job Fairs and Black History Week events.

Alexander said he was pleased to compete in the World Championship of Public Speaking, even though he didn't win. However, he is undecided about trying again next year because of the amount of time it takes to prepare and practice a contest-quality speech. At present, he is spending much of his spare time leading a church building project.

He is not going to rule out another attempt at the world speaking title yet, though, because he remains convinced, as he said in his speech, that "you can make it if you try."

## HARM Launched Successfully from Fighting Falcon at Edwards AFB

An AGM-88 High-Speed Anti-Radiation Missile (HARM) was launched from an F-16 Fighting Falcon for the first time Sept. 23rd during a test mission at Edwards AFB, Calif.

The launch is the latest step toward fully integrated HARM/Shrike capability for F-16Cs in the defense suppression role by the U.S. Air Force.

The AGM-88 is a radar-seeking weapon manufactured by Texas Instruments. The F-16/HARM flight test program will include five additional launches at Edwards over the next few months.

HARM/Shrike capability is being added to the Fight-

ing Falcon in three phases. The 52nd Tactical Fighter Wing at Spangdahlem Air Base, West Germany, replaced its F-4E aircraft with Shrike-capable F-16Cs under Phase I in 1987. The unit's F-16Cs are currently being flown with F-4G Wild Weasel aircraft as the "killer" element of Wild Weasel hunter/killer radar suppression teams.

Phase I provided quick-reaction, interim F-16C Shrike missile capability. The first HARM launch was made under Phase II of the program, which expands the quick-reaction capability to include the AGM-88. The launcher is mounted on wing weapons pylons in its F-16 application. Missiles will be carried and launched on stores stations 3

and 7 in the flight test program.

The F-16C requires no hardware or software modifications to achieve quick-reaction HARM/Shrike capability under Phases I and II.

The final step, Phase III, will be accomplished at F-16 production Block 50 in late 1991. Phase III, currently in development, will greatly enhance the F-16's versatility in carrying and launching HARM and Shrike missiles by providing fully integrated weapon interface provisions, including links with the Fighting Falcon's Threat Warning Receiver equipment.



**Checking for Leaks.** Alan J. Potts, a Land Systems employee, makes sure the crew compartment of the M1A1 Abrams tank remains watertight during a survivability test at the Detroit Arsenal Tank Plant. Abrams tanks are designed to withstand a 15-minute submersion in four-foot deep water with all internal systems, including the engine, operating normally. The testing helps identify any electrical problems that might develop before the turret is attached to the tank hull during final assembly.

## First Tenants Occupy New Valley Systems Division Building

As part of a program to reduce the number of buildings leased by Valley Systems in order to cut costs and consolidate operations, Building 602 is being occupied by employees who have been working in leased buildings.

Machine Shop employees were the first to move in, followed by the Material Acquisition Department. This is the first time that the latter department has occupied division property since the division was formed in October 1985.

Other departments scheduled to move into the new two-story, 400,000-square-foot building include Security, Safety and Health, Test Equipment, Transportation, Salvage/Material Storage, Material Center and Shipping/Receiving, RAM Production, Hourly Training and some staff members from Production and Quality Assurance.

When fully occupied, Building 602 will contain manufacturing and office areas, a cafeteria and an employee fitness area.

There are two other buildings on the Valley Systems Division site at the present time — a manufacturing facility (Building 600) and the administrative/support services building — (Building 601).

The new building is part of the division's master plan, which incorporates 75 acres of division-owned property plus a measurement range.





**Farnborough highlights.** Aerospace companies from around the world gathered at Farnborough, England, in September to demonstrate their products at the biennial air show. A daily feature was a flight demonstration by a Fort Worth-produced F-16C Fighting Falcon. Another highlight was the first appearance at a Western air show by a front-line Russian fighter, the MiG 29 Fulcrum. In photos clockwise from top: a portion of the crowd views some of the aircraft on exhibit; Soviet test pilot Anatoly Kwachur (left), holding an F-16 model and a bag of gifts given him by General Dynamics representatives, meets his opposite number from General Dynamics, Kevin Dwyer; the F-16C, trailing smoke, gives one of its daily demonstrations; the MiG 29 Fulcrum climbs into the skies over Farnborough.

## Company Sponsors PBS Program on Kennedy Assassination By Chuck DeMund

A quarter of a century has passed since an assassin's bullets ended the life of President John F. Kennedy. The images of that fateful event and the November weekend that followed — when a family, a nation and the world mourned America's dynamic young leader — still exert a powerful and painful hold on the consciousness of all those who watched them unfold in 1963.

To recapture the impact of President Kennedy's assassination, General Dynamics commissioned the Susskind Company to produce a documentary film, "JFK - A Time Remembered." It will be broadcast nationally on PBS on Nov. 21st, 1988, the eve of the 25th anniversary of the assassination. (See local TV listing for time and channel.)

Award-winning director Mark Obenhaus and his camera crew spent months crisscrossing America interviewing Kennedy intimates, administration officials, journalists and others. Using gripping news footage, interwoven with the poignant recollections of many of those who were most closely involved, "JFK - A Time Remembered" recaptures the emotion of those few days for those who lived them . . . and for the growing number of Americans too young to remember.

President Kennedy had arrived in Dallas that November to shore up his political strength in Texas, which at the time was racked by internal feuding within the state's Democratic Party.

"Back then, Kennedy was not the popular idol we think

of today," recalls New York Times journalist Tom Wicker during the program. "In the fall of 1963, his popularity was down. Despite that, I don't recall any hostile signs during that trip to Dallas."

"The sense of John Kennedy when he was alive was not of greatness, but of potential greatness," says CBS anchorman Dan Rather. "What he brought to the presidency was excitement, energy, style and a sense of humor. When all that ended in a terrible flash in death, it made the mourning all the deeper."

The program shows the all-too-familiar motorcade ride with Kennedy and wife, Jacqueline, waving from an open car as they neared the Texas School Book Depository. Then Kennedy slumped forward and the motorcade sped away. An eyewitness to the shooting recalls, with great pain, the awful expression on Kennedy's face when struck by the bullets from Lee Harvey Oswald's rifle. But for most of that day, he recalls, there wasn't the knowledge of the shooting, only of something amiss.

"I remember thinking how the motorcade took a wrong turn and was moving very fast, indicating something was wrong," Rather says. "People were screaming, there was great confusion, but I didn't know what was wrong because I hadn't heard any shots."

Through vivid footage and recollections from Kennedy aides Lawrence O'Brien and Dave Powers, the program

documents the despair felt by people nationwide as they awaited news from Parkland Hospital, where the President had been taken.

Once Kennedy had been pronounced dead, journalists such as Nancy Dickerson and Sander Vanocur set about presenting the news and events to the world. Theirs was a painful assignment, a fact underscored by a clip of CBS anchorman Walter Cronkite succumbing to grief while on the air. "JFK - A Time Remembered" follows the return of Kennedy's body to Washington, captures the symbolism of Vice President Lyndon B. Johnson's speech at the airport as he asked for support from his countrymen and revisits the funeral that Sunday.

Along with footage of Oswald's arrest and subsequent assassination by Jack Ruby, the documentary examines the impact that television coverage of the period's tumultuous news had on America as a whole.

"That weekend marked the first time that I was awestruck by TV," recalls Johnson aide Jack Valenti. "After that weekend I regarded TV with wonderment, that it had this power to transmit and move people in this way."

This program is the fifth major PBS presentation to be underwritten by General Dynamics. The first four were David Susskind-produced one-man portrayals of Winston Churchill, Dwight Eisenhower, Lyndon Johnson and Pope John XXIII.





Low



Buchanan

## Reginald Low Named Corporate Vice President; Succeeds Dr. Buchanan

Reginald G. Low, Vice President-Standard Missile Programs at Pomona, has been named Corporate Vice President-Technology Development & Engineering. Low succeeds Dr. Leonard F. Buchanan, a 32-year General Dynamics veteran, who has elected to take early retirement this month.

A native of San Francisco, Low joined Pomona in 1957 as an electronics engineer and progressed through key engineering and management assignments, including Section Head of Autopilots and Guidance Computers, Manager of Computers and Servomechanical Design, Assistant

(Continued on Page 2)

## Miami Is Christened In Ceremony Nov. 12th At Groton

By Myron R. Holtzman

Calling her the "best this country can assemble," Vice Adm. Roger F. Bacon, Commander, Submarine Force Atlantic, helped launch *Miami* on her way on the bright, crisp morning of Nov. 12th at Electric Boat. Admiral Bacon, who was the principal speaker for the launching of the SSN 688-class nuclear fast-attack submarine, said the *Miami* and ships like her are our "principal deterrent to war because of her high-tech capabilities."

Mrs. Jane Pohl Wilkinson, the submarine's sponsor and the wife of Vice Adm. Joseph B. Wilkinson Jr., christened the Navy's newest ship by smashing a bottle of champagne over her bow and pronouncing the traditional words, "In the name of the United States, I christen thee *Miami*. May God bless her and all who sail in her."

Almost instantaneously George Lucas, who retired last spring after 35 years at Electric Boat in key management positions, pulled the lever that released the submarine from her supports, and the 6,900-ton, 360-foot long ship

(Continued on Page 2)



**Traditional Christening.** Mrs. Jane Pohl Wilkinson smashes a champagne bottle on the strike plate of *Miami* during launch ceremonies Nov. 12th at Electric Boat. Looking on are Chairman and Chief Executive Officer Stanley C. Pace and Dr. Mary Wilkinson, Matron of Honor.

## F-16A Launches Its First AIM-7 Sparrow At Pacific Missile Test Center, Calif.

By Joe Stout

The first Fighting Falcon launch of an AIM-7 Sparrow beyond-visual-range missile was successfully made last month at the Pacific Missile Test Center off Point Mugu, Calif.

The missile was launched from the Air Defense Fighter test aircraft, F-16A No. 271, during a 1.7-hour flight from Edwards AFB, Calif. The Air Force Flight Test Center pilot, Maj. Wayne M. Denesik, reported that all test objectives were met and that the missile departed the aircraft on a straight forward trajectory.

The missile was launched from wing store station No. 7 at 39,500-foot altitude during a pass of the Navy range at .9 Mach. The F-16 was configured with a second AIM-7 on station No. 3; AIM-9 Sidewinder missiles on stations No. 1, 8 and 2; 370-gallon fuel tanks on stations No. 4 and 6, and a camera pod on station No. 9.

G. Michael Spencer, Fort Worth's Edwards AFB flight test engineer for the program, described the firing sequence as a "perfect launch."

The AIM-7 is an all-weather, all-aspect, medium range radar missile produced by General Dynamics and Raytheon Company. The first guided AIM-7 launch from an F-16A is scheduled for later this year, and the first AIM-7 launch from an F-16C is set for early next year.

The F-16A/B Air Defense Fighter flight test program

will include a total of 13 AIM-7 separation firings. In addition, four guided launches will be made against target drones.

The incorporation of AIM-7 capability is a logical step in the F-16's evolution as an all-weather, day-or-night capable fighter. The F-16 was introduced in 1979 as the day-only "low" element in the U.S. Air Force's "high/low" fighter force mix. AIM-7 will provide the aircraft its first operational beyond-visual-range missile capability and further enhance its air-to-air effectiveness.

Sparrow capability is particularly significant to international air forces that fly the F-16 or will add it to their inventories in the future. The Sparrow option will complement the F-16's capability to carry and launch the AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM).

F-16 AIM-7 integration was first analyzed and demonstrated in the late 1970s, before the beginning of production aircraft deliveries, with a YF-16 prototype.

An integral pylon/rail launcher is used in the F-16 AIM-7 application. Major aircraft modifications to the F-16A include addition of a Continuous Wave Illuminator for missile guidance, antennas, wiring provisions and an Enhanced Missile Remote Interface Unit.



**First Fighting Falcon Launch.** AIM-7 Sparrow is launched from F-16A No. 271 at the Navy's Pacific Missile Test Center.

## Company, IAM&AW Join in Comprehensive Program to Fight Alcohol and Drug Abuse

General Dynamics and the International Association of Machinists and Aerospace Workers (IAM&AW) have announced the signing of a landmark agreement on a comprehensive alcohol and drug abuse program.

"This program addresses the fundamental problems of education and rehabilitation and is a first of its kind in the defense industry," said George J. Chopp, General Dynamics Staff Vice President-Employee Relations, and James A. Pinto, the IAM&AW's Director of Coordinated Bargaining, in a joint statement.

The agreement provides that union and company supervisors receive at least four hours of side-by-side training in recognition and identification of employee alcohol and drug abuse, in alcohol and drug testing procedures and safeguards and in methods of referring employees to the Employee Assistance Program.

An Employee Assistance Program (EAP) with specially trained counselors also will be made available to employees and their dependents who seek confidential help for alcohol and drug abuse.

"We wanted to work together in creating a drug-free workplace and a nonpunitive environment where em-

ployees could come to the union or to the company for help in dealing with an addiction," Chopp said. "Our joint goal is to rehabilitate rather than discipline employees who have these problems. We believe it's the best solution for all involved."

The agreement contains provisions for alcohol and drug testing in situations where an employee is determined to be working under the influence of alcohol or drugs. For the first positive test the employee would be offered the opportunity for assistance without discipline. The second positive test would require discipline and assistance and the third positive test would result in discharge.

The agreement follows a joint intent announced by the company and the union last May to cooperate in combating alcohol and drug abuse among employees. While both parties recognized that the problem within General Dynamics was no greater than in other industries or society in general, it was determined that a cooperative effort was needed if the use or sale of alcohol and drugs in the workplace was to be eliminated.

(Continued on Page 2)



## Company Is Strengthening Its Small/Disadvantaged Business Program

The Corporate Material Department is implementing an innovative program to help strengthen the company's Small/Disadvantaged Business (SDB) efforts.

The program consists of 15 initiatives, collectively entitled "Elements of an Excellent Small/Disadvantaged Business Program." It combines a large number of activities and initiatives designed to identify qualified SDBs, provide training, establish financial goals and counsel SDBs doing business with General Dynamics, according to Monty W. Dickinson, Staff Vice President - Material.

"This program is being implemented at all divisions and will become the central core of their SDB programs," Dickinson said. "A key issue in the award of future prime contracts will be the evidence of a strong and effective SDB program."

"It is imperative," Dickinson said, "that we continue to coordinate the efforts of Engineering, Facilities and other departments with our small business offices to ensure that we identify all potential SDB competitive opportunities."

John D. Huebener, Corporate Purchasing Manager, said that General Dynamics awarded 21,398 subcontracts valued at more than \$65 million to more than 950 SDB firms in 1987.

"Figures to date indicate that we may exceed those figures for 1988," he said. "And in 1989 we will be looking to improve on this performance."

"The General Dynamics SDB program has demonstrated a steady growth of awards to these firms," Huebener added. "It has been our objective to ensure that maximum competitive opportunities are afforded to small/disadvantaged firms throughout the General Dynamics procurement process."

"For more than two decades," Huebener said, "the company has promoted a strong and dynamic SDB program within its divisions. We recognize that doing business with qualified minority suppliers not only makes good business sense but also contributes to our cost reduction goals."

Huebener said an SDB firm is defined as one that is at least 51 percent owned and controlled by a socially and economically disadvantaged individual (male or female) who manages and controls daily business operations. This group includes Black Americans, Hispanic Americans, Native Americans (including American Indians, Eskimos, Aleuts and Hawaiians), Asian-Pacific Americans (including United States citizens from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, Laos, Cambodia and Taiwan), Asian-Indian Americans (including United States citizens from India, Pakistan and Bangladesh) and other minorities or individuals found to be disadvantaged by the Small Business Administration.

"General Dynamics' SDB program was established prior to the passage of Public Law 95-507 in October 1978,"

Huebener said. "This law established the government's policy of contracting with SDB firms. Recent passage of other laws, such as PL 99-661 and PL 100-180, are imposing more stringent challenges on the Department of Defense. Many of the provisions of these laws have subsequently flowed down to the prime contractors."

Huebener said the company's SDB program has the strong support of executive management.

"Commitment to the SDB program starts at the top," Huebener said. "Stanley C. Pace, Chairman and Chief Executive Officer, has issued two Executive Memorandums in support of the program and the initiatives. With his support, and the dedicated work of all General Dynamics Procurement personnel, small disadvantaged business has become an important part of our supplier team."

In one of the memorandums, Pace said: "This company will be dedicated to the concept of providing equal opportunities to small/disadvantaged businesses. All members of management are expected to work toward maintaining General Dynamics in a position of leadership with respect to this important aspect of equal opportunity."

Huebener noted that company support is demonstrated by the fact that division procurement personnel who do an outstanding job in this area are recognized annually. The 1987 corporate award was presented recently to Thomas E. (Tim) Dennis, Senior Buyer at Fort Worth.



A Large Crowd Watches As the *Miami* Slides into the Thames River at Groton, Conn.

## Submarine Miami Is Christened at Electric Boat

(Continued from Page 1)

slid down the greased ways and into the Thames River.

"Because of ships like *Miami*," Admiral Bacon said, "the Navy can have confidence in the submarine's future in the U.S. fleet and its superiority over the Soviets. They are the masters of the undersea environment . . . enabling us to sail in harm's way whenever the necessity arises."

The *Miami* (SSN 755), the 23rd *Los Angeles*-class submarine launched at Electric Boat, features an advanced combat and sonar system that is directly linked to its weapons launching system. It also has retractable bow planes and hardened sail for improved under-ice operations. The launch was the first at Electric Boat since the Trident submarine *Pennsylvania* was christened April 23rd.

"No matter what treaties have been signed, the guarantee that America is adequately defended is our best guarantee," said Chairman and Chief Executive Officer Stanley C. Pace, master of ceremonies for the launching. "The *Miami* and others like her are the most effective deterrents

ever produced. They can conduct highly independent covert operations against a variety of targets."

Other speakers included: James E. Turner Jr., Vice President and General Manager of Electric Boat; J. L. Plummer Jr., Commissioner of the city of Miami; Rear Adm. John Claman, Supervisor of Shipbuilding at Groton; and Under Secretary of the Navy H. Lawrence Garrett III.

Dr. Mary Wilkinson, the daughter of Admiral and Mrs. Wilkinson, served as Matron of Honor.

*Miami* is the first submarine and the third U.S. Naval ship to bear the name of Florida's vacation city. The first was a sidewheel, double-ender, wooden-hulled gunboat launched in 1861 during the Civil War. The second was a light cruiser launched in 1942 that went on to earn six battle stars during World War II.

The newest *Miami* is the 39th *Los Angeles*-class fast-attack submarine. Electric Boat has produced 23 of those and holds the contracts for nine more.

## Reginald Low Named Corporate Vice President

(Continued from Page 1)

Program Director of Stinger-POST, Director of Design Engineering and Division Vice President - Research and Engineering.

Low is a member of the Dean's Council of the University of California at Los Angeles School of Engineering and Applied Science. He is also a member of the UCLA Engineering and Management Program Policy Committee.

He earned a Bachelor of Science degree in Electrical Engineering from the University of California at Berkeley in 1957 and a master's degree in business economics from the Claremont Graduate School in Claremont, Calif., in 1968. He is currently enrolled in a doctoral program at Claremont.

Low's appointment is effective in January.

Dr. Buchanan, recognized as a defense weapons systems authority in the aerospace industry, joined the company in 1956 as a dynamics engineer. He advanced through a variety of positions at Pomona, culminating in his appointment as Vice President and General Manager there in 1974. He was named Vice President and General Manager of Convair in 1977 and moved to St. Louis in 1982 to take the position of Corporate Vice President-Engineering & Program Development.

He became Corporate Vice President-Advanced Engineering and Business Development in 1986 and was appointed Corporate Vice President-Technology Development & Engineering in 1988.

Dr. Buchanan has served on many boards and committees in the aerospace industry, including the Aerospace Technical Council of the Aerospace Industries Association; the Engineering Advisory Council of the University of California; the Department of the Navy, Naval Research Advisory Committee; United Way of San Diego County; and the Association for Unmanned Vehicle Systems.

## Company, IAM&AW Join to Fight Abuse

(Continued from Page 1)

Implementation of the program will start with education, training and the establishment of the EAPs at all locations. EAPs will also offer counsel to employees with other problems that may be associated with alcohol or drug abuse, including marital, financial or legal difficulties. Company officials plan to use the alcohol and drug abuse program as a first step in starting similar programs for salaried and hourly employees corporatewide.

This agreement pertains to General Dynamics employees at its Convair, Data Systems-Western and Pomona Valley Centers, Electronics, Pomona, Space Systems and Valley Systems divisions and its subsidiary, Cessna Aircraft Company. These employees are represented by the IAM&AW, its District Lodges 50, 70 and 120 and Local Lodges 774, 1125, 1980 and 2242.

## NMA Chapter Holds Sign Language Course

Fort Worth's National Management Association chapter recently sponsored a basic sign language course for hearing coworkers of the more than 20 hearing-impaired or deaf employees at the division.

The 10-week course covered sign and finger spelling, along with information about the special challenges faced by the hearing-impaired. "It was a broad orientation to what it's like to be hearing-impaired, designed to provide insight to the hearing population," said Bill J. Smelley, the NMA's Vice President of Professional Development.

More than 20 employees took the course, including some who interact with deaf persons outside of work. It

was offered in cooperation with Tarrant County Junior College and taught by a TCJC instructor, said Mike Threadgill, audiologist in the division's Medical Services section of Human Resources.

The course was originally suggested by two hearing-impaired employees, Paul F. Jakins and G. Mack Harris. The response has been so positive that a more advanced course in sign communications may be offered next spring, Smelley said.

Pomona has offered similar instruction through its support program for hearing-impaired employees, according to Threadgill.





**Distinctly American Contribution.** The U.S. Geodesic Dome Pavilion in Bangkok was dedicated recently as a gift to the people of Thailand. It was funded by General Dynamics and other American companies with interests in Thailand.

## Domed Greenhouse Is Donated to Thailand

The U.S. Geodesic Dome Pavilion, a modernistic greenhouse where desert plants can thrive, was constructed recently in Thailand with financial gifts from General Dynamics and other American companies.

The dome in the botanical garden of Bangkok's Rama IX Park contains a diverse collection of plants and will be used primarily for educational purposes.

The dome was selected as the structure's basic design because it is considered distinctly American since it is the

work of U.S. inventor Buckminster Fuller. The dome also provides an ideal environment for cacti and other desert plants that require both warmth and aridity.

The pavilion was dedicated on the birthday of King Bhumibol Adulyadej, the longest reigning monarch in Thai history.

The Royal Thai Air Force has ordered 18 General Dynamics-built F-16 Fighting Falcons, the first of which was delivered earlier this year.

## Orders for Citations Show Large Increase So Far This Year

Cessna Aircraft Company reports that orders for its Citation business jets have increased 61 percent in the first nine months of 1988 compared to the same period last year.

"In fact, September was our best month for Citation orders in more than five years," said Roy H. Norris, Cessna's Vice President of Citation Marketing.

Norris said orders for Cessna's flagship fanjet, the Citation III, have doubled so far this year compared to 1987 and that Citation II and Citation V orders have been strong.

"We have already sold all 36 Citation Vs that will be built in 1989," Norris said, "and our Citation II backlog is steadily growing well into 1989."

Norris said export sales of Citations were up from 16 percent of total sales in 1984 to 36 percent so far this year.

"Certification of the Citation III this year in the United Kingdom, West Germany and Australia has been partly responsible for this," Norris said, "but we are seeing excellent order activity for all models in many countries."

He also pointed out that Citation III orders have started coming from Fortune 1,000 companies instead of primarily Fortune 500 corporations. "More companies are realizing that the Citation III's advanced technology benefits are well worth the additional cost," Norris said. The Citation III is the only all-new business jet designed and produced in the United States since the original Citation in 1972.

## Earnings and Sales Are Announced for Third Quarter, Nine Months

The company announced Oct. 19th that earnings for the third quarter of 1988 were \$96.4 million, or \$2.29 per share, compared to earnings of \$111.5 million, or \$2.62 per share, for the third quarter of 1987. For the first nine months, earnings were \$268.8 million, or \$6.39 per share, compared to \$342 million, or \$7.99 per share, in the same period a year earlier. Third quarter earnings for both periods include tax benefits of \$20 million from tax law changes resulting in reductions in deferred taxes.

Sales were \$2.3 billion for the third quarter and \$7 billion for the nine months, compared to \$2.3 billion and \$6.9 billion a year ago. Funded backlog at the end of the 1988 third quarter was \$15.8 billion and total backlog (funded and unfunded) was \$22.9 billion, representing approximately 2.4 years of sales. Comparable amounts at

the same time last year were \$15.2 billion and \$22.9 billion.

"The strike at Electric Boat was the principal cause of the third quarter earnings decline from the same period last year," said Stanley C. Pace, Chairman and Chief Executive Officer. "However, we believe that terms of the Oct. 11th labor settlement improve our position for future submarine competitions. Our recent award of the 16th Trident submarine continues our role as the sole builder of that very important class."

Third quarter results are lower than the same period last year, in part because of continued investments in the Atlas expendable launch vehicle program and advanced aerospace programs, particularly the U.S. Air Force's Advanced Tactical Fighter. "While these programs are currently incurring high development costs, we expect

them to make significant contributions to operating earnings in the long term," Pace said. "Our overall commitment to cost containment is evidenced at Land Systems and at Cessna, both of which show improved earnings."

"During the third quarter, we were one of three participants picked to develop the technology for the U.S. Air Force's Advanced Launch System," Pace said. "Pomona, teamed with Westinghouse, was named one of two finalists for developing the Advanced Air-to-Air Missile, and Pomona was also awarded 100 percent of the first competitively bid Phalanx gun system contract. These wins reinforce our lead role as a supplier of space technology and related launch services, as well as a leading producer of tactical missile and gun systems."

## Pomona's Gillingham Boosts Division's Health/Fitness Center

By Terry Snyder

Last May, 52-year-old Richard (Dick) Gillingham was rushed to the hospital with all the classic symptoms of a heart attack. Although it turned out that he narrowly escaped a full-blown cardiac arrest, "My doctor told me it was a dress rehearsal for a heart attack," the Pomona Manufacturing Manager recalled.

When Gillingham was discharged from the hospital after three days in the cardiac care unit, he faced the realities of beginning the hospital's exercise rehabilitation program. It was a new experience for a man who had lived a sedentary lifestyle for the past 20 years.

"I wasn't looking forward to the idea of going back to the hospital every day," he said. "I thought, there's got to be a better way."

At the encouragement of his boss, Manufacturing Director Jack Brady, Gillingham looked into Pomona's Health/Fitness Center as an alternative. "My doctor said he didn't care where I exercised, as long as I did it faithfully," he said.

Gillingham met with Pomona Health/Fitness Coordinator Robin Moon, who began working with him on his rehabilitative exercise needs. She tested him and set up an exercise prescription personally tailored to his condition. Week by week, Gillingham made steady progress. "When he first came in, Dick could walk about 10 minutes on the treadmill," Moon recalled. "Now, he's up to an hour."

Within a few months, Gillingham lost 17 pounds, improved his pulse rate, and increased his cardiac endurance. However, the most profound change was emotional. "I was excited about how good I began to feel," he said. "I'd never really exercised regularly before. Now, I was discovering that I was fresher at the end of a day, and I was better able to handle stress. I thought, if this benefits me, I'm probably not the only one."

Gillingham began talking to his employees, encouraging them to sign up for an exercise program. Several joined him in his weekly exercise sessions. Soon he noticed an improvement in the performance of those employees. "They were generally fresher at the end of tough days," he said. "There was a common bond developing between the employees who worked out together."

Now Gillingham is determined to get more of his employees involved. He has a stack of applications for the center and even sets up test appointments for his employees. He also makes sure they keep them. If he doesn't see an employee at the Fitness Center for a few days, he finds out why.

"Obviously, I don't want to twist anyone's arm," he said. "I just feel so enthusiastic about how it's changed my life that I try to encourage everyone to take advantage of this voluntary program. I think it's terrific that the company provides this opportunity."

Pomona's Health Enrichment Program is an employee-funded service that promotes health screening and education programs and operates the center for Pomona employees and their families. "We're more than just a gym," said Health and Services Supervisor Andy Astadurian. "We're a corporate health and fitness center dedicated to helping our employees get the most out of their personal and professional lives through improving their physical well-being."

To date, more than 20 of Gillingham's employees and coworkers, ranging in age from 26 to 62, are exercising regularly. "My chief of dispatching has lost 39 pounds," he pointed out. Other Pomona employees are also learning how exercise can change their lives. "I hate to use the term recruiting," he said, "but if I can use myself as an example



Dick Gillingham and Monitor Robin Moon

to get others to start exercising and feeling better about themselves, it's worth it."





**Access to Success.** Marguerite Ross Barnett, Chancellor of the University of Missouri-St. Louis, and Chairman and Chief Executive Officer Stanley C. Pace (right) announced the "Access to Success" program during a recent press conference. The company has teamed with UM-St. Louis to help provide quality education to talented, but poor, sixth-to-eighth grade students in three St. Louis-area school districts. "The meanest man in town is the man who kills hope," Pace said at the announcement. "This is a program that is important in instilling hope rather than killing hope." The company provided a gift of \$300,000 to fund the program over a four-year period. All academic activities will be developed and taught by UM-St. Louis faculty, while public school personnel also will be involved. Also at the ceremonies were: Ronald Stodghill (far left), Superintendent of the Wellston School District, and Ronald Paulsen, Director of Curriculum and Instruction at the Normandy School District. University City is the other district in the program.

## Management Club Aids Lima Senior Citizens

Members of the General Dynamics Management Club in Lima, Ohio, recently completed a two-year project of overhauling the Senior Citizen's Country Store.

Club members removed stone and block from the store's flooring in 1986 and replaced them with subflooring and linoleum. The project might have ended there, but the improved looks of the interior made it apparent that the outside also needed work.

"The hard part of fixing up the store was knowing where to stop," said Margaret R. Standriff, an analyst in

Management Systems and Procedures.

The building is an architectural gem, but it had not been painted for years. Club members installed new downspouts and completed repairs before installing the first coat of primer.

Some 50 club members devoted almost 400 hours to the project. They spent time over the last three years helping with the store's Ice Cream Social. This year, 15 club volunteers helped bring in more than \$800 for the benefit of the senior citizens.

## Cessna Names Second English Citation Station

Cessna Aircraft Company has appointed a second Citation Service Station in England in response to the growing fleet of Citation business jets in that country.

IDS Aircraft Ltd., located at Bournemouth International Airport in Christchurch, is authorized to service the 500 series Citation models (Citation I, II and S/II).

"We are pleased to announce this expansion of our

service capability in the United Kingdom," said Cessna's Director of Service Facilities, James E. Morgan. "IDS Aircraft is particularly well situated to serve our Citation owners in southern England."

Morgan said that the IDS facility will supplement the service provided by Cessna's original U.K. Citation Service Station operated by Marshall of Cambridge since 1974.



**President's Award.** Herbert F. Rogers, President and Chief Operating Officer (right), presents the General Dynamics President's Award to Sterling Starr, Vice President and Pomona General Manager, at a recent ceremony at the division. Pomona received the award for setting the standard in the Corporate Environmental Resources Management program for eliminating the generation, discharge and disposal of hazardous waste materials. Since 1984, Pomona has removed 28 underground storage tanks and eliminated all 19 PCB electrical transformers. By the end of the year it will have reduced hazardous waste leaving the facility by 96 percent, from 11,000 tons per year to 400 tons per year.

## Cessna's Citation V Awaits Certification And Its First Delivery

FAA certification of Cessna Aircraft Company's new Citation V business jet is expected by mid-December, followed by delivery of the first aircraft in March.

Two prototype aircraft have flown more than 825 hours since flight testing of the first aircraft began in August 1987. The flight time was about equally divided between an engineering prototype and a pre-production prototype.

"We couldn't be happier with the way the Citation V certification program has gone," said Cessna Chairman Russell W. Meyer. "All the performance tests have met or exceeded our projections."

Meyer said that Cessna will hold the line on a price increase for the second block of Citation Vs for those customers who order their aircraft this year for delivery by April 30, 1990.

"Customer response to the Citation V has been almost overwhelming," Meyer said. "The program was announced just one year ago and we already have sold all 36 aircraft in the 1989 production schedule. We want to maintain this momentum and give as many customers as possible the opportunity to purchase this outstanding new aircraft at the very competitive introductory price of \$3.995 million."

The Citation V is a larger, much faster, more powerful derivative of the Citation S/II.

"Acceptance of the Citation V was immediate," Meyer said, "and order activity has been brisk from the start. The airplane's superb combination of speed, cabin comfort, climb performance, range and ability to operate out of relatively small airports have made it the instant success that we knew it would be."

The standard-equipped price includes almost \$400,000 worth of equipment that usually is considered optional on other aircraft.

Powered by Pratt & Whitney JT15D-5 engines, the Citation V features a fuselage that is almost two feet longer than the Citation S/II. The additional length improves the eight-passenger, double-club seating arrangement by providing greater legroom and more space for reclining seats and cabinetry.

## Electronics Awarded C-17 ATE Contract For Avionics Testing

Electronics Division has received a contract from McDonnell Douglas Corp. for automatic test equipment (ATE) to support the U.S. Air Force C-17 cargo aircraft.

"Winning the C-17 contract fulfills one of our key strategic objectives of capturing additional markets for our existing ATE product base," said Walter P. Robertson, Electronics Division Vice President - Automatic Test Systems Programs.

Electronics will build eight digital/analog/video test stations for the C-17 that are identical to the stations Electronics built for the B-1B strategic bomber, except for enhanced reliability and supportability. Electronics will also build three photometric benches similar to the benches it produces for the F-16 Fighting Falcon test equipment. The optical benches will be modified for specific tests on the C-17's heads-up display and multifunctional display.

To expedite development of test program software, Electronics will also deliver 16 software ministations and two software development systems to McDonnell Douglas. They will also integrate and maintain two digital/analog/video stations on loan to McDonnell Douglas from the B-1B program.

Electronics Division has been building proven avionics test equipment, including the F-16 Avionics Intermediate Shops and the Intermediate Automatic Test Equipment for the B-1B, for more than a decade.

## Component Delivered

General Dynamics Services Company reached a major milestone on Oct. 5th when it completed the first component, a Titan aft adapter, on the Space Offload Program at its facility in Harlingen, Tex.

Harlingen will be producing 14 different jettisonable components for the Space Systems Division for use on the Atlas I, Atlas II and Titan/Centaur Expendable Launch Vehicle Programs. The Harlingen facility has been open less than a year and will also be performing aircraft modification work for the U.S. Air Force.



## F-16 Subcontractors Working to Achieve Quality Improvement

Fort Worth carried the quality improvement message of Statistical Process Control (SPC) to the F-16 subcontractor community during a recent conference for Fighting Falcon material and subsystem suppliers.



Colonel Harrington

SPC, the thrust of a General Dynamics corporate initiative, is a method of controlling or monitoring processes to prevent the production of costly, non-conforming parts. SPC helps ensure that parts stay within design tolerance during manufacturing, as opposed to the traditional method of inspecting parts after they are made.

The presentation was attended by representatives of 105 supplier companies, in addition to U.S. Air Force and General Dynamics personnel.

The overview explained SPC and its relation to other division activities under the Defense Department's "Total Quality Management" umbrella, including the Variability Reduction Program and the General Dynamics Impact 2000 effort.

Lewon D. Simpson, Division Vice President-Material, said the programs are designed to achieve continuous quality improvement, reduce production costs by eliminating scrap and rework and provide employees with the tools, training and responsibility to make products right the first time, within cost and schedule.

"SPC is an important tool we are implementing in-house and are now introducing to our suppliers," Simpson said. "Studies show that the cost of poor quality runs as high as 40 percent of revenues for many firms. The industrial average is running close to 25 percent. In effect, firms are spending a quarter of their income patching up their own mistakes."

These costs are eventually passed on to the customer, said Col. J.H. Harrington, Deputy, Special Assistant for Reliability and Maintainability at USAF Headquarters. To combat the expense of defective parts in U.S. weapons systems production, the DOD has targeted a policy of 100 defective parts per million by 1990, Colonel Harrington said.

SPC will help suppliers measure their progress toward this goal, he said. Colonel Harrington cited management commitment and employee involvement as crucial factors in the success of ongoing quality improvement efforts.

"A total of 85 percent of the defects produced by industry are caused by the system (materials, capital and human resources)," he said. "Only management can improve the system. If management allows workers the authority and the capability, they will control the process."

Chris A. Sheidler, Fort Worth's SPC Coordinator, said General Dynamics is working with its supplier team to implement total SPC participation by 1991.

### Savings and Stock Investment Plans

Annual Rate of Return for the 12 Month Period Ending:

	Sept. 1986	Sept. 1987	Sept. 1988
<b>Salaried</b>			
Government Bonds	13.4%	4.7%	8.4%
Diversified Portfolio	36.1%	47.3%	(13.3)%
Fixed Income	12.0%	11.7%	10.8%
<b>Hourly</b>			
Government Bonds	12.8%	4.9%	8.7%
Diversified Portfolio	37.2%	49.4%	(13.8)%
Fixed Income	12.1%	11.8%	10.7%
<b>GD Stock Closing Price</b>	\$71.37	\$69.50	\$50.50

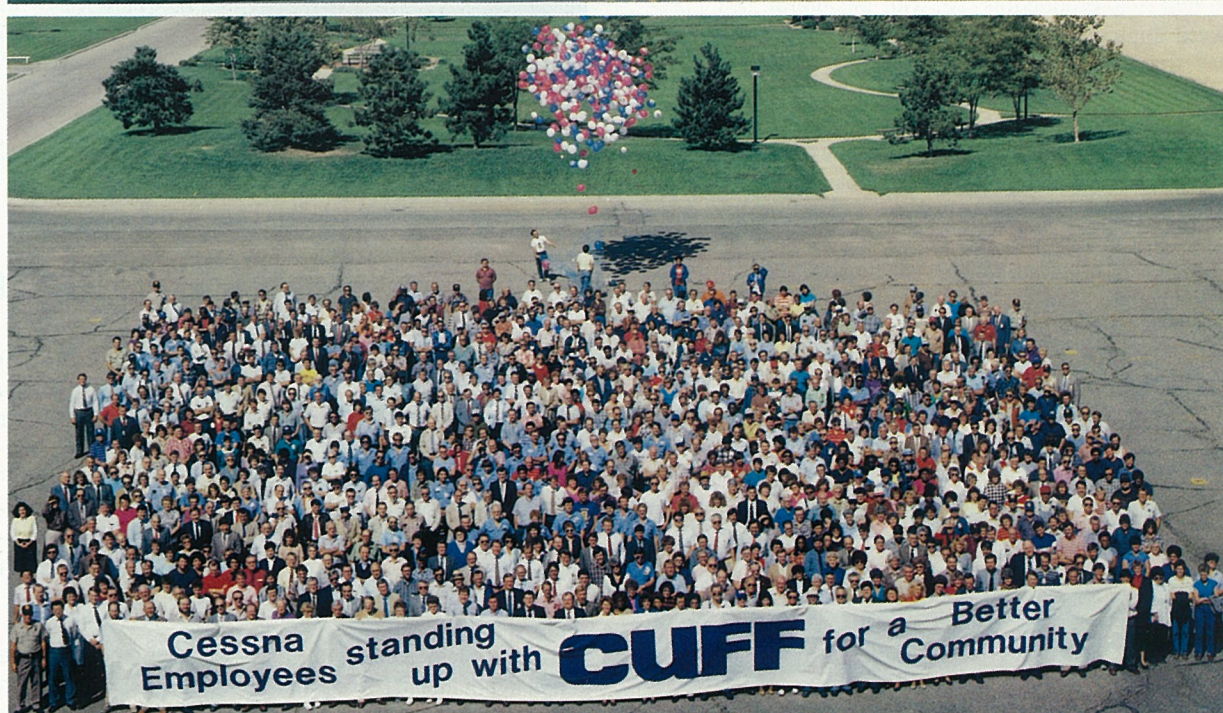
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## World

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**On the CUFF for United Way.** Several thousand Cessna Aircraft Company employees demonstrated their support of the United Way of the Plains in Wichita, Kan., recently by turning out for two mass photo sessions. Employees at the Pawnee facility (top) assembled at dawn and were entertained by a local radio personality who broadcast his show from the scene. Mid-Continent facility employees (bottom) faced the cameraman that afternoon. Giant, framed enlargements of the photos will be displayed at several Cessna locations to pay tribute to the contributors. CUFF (Cessna United Friendship Fund) members pledged \$350,000 to the United Way and other social service agencies. Contributions from the Cessna Foundation and the executive giving program pushed Cessna's total to \$500,000, an increase of \$40,000 over last year.

## David T. Weber "Walks in Employees' Shoes" For Better Understanding of Their Jobs

By Joe Stout

Fort Worth's David T. Weber believes in the old expression that you have to "walk in another person's shoes" to fully understand that person's responsibilities.

Weber, Chief of more than 60 hourly employees in three sections of the Office Services Department, decided he could perform his job better if he could do just that — figuratively walk in his employees' shoes.

Weber recently began a program that will put him in the position of a first-line Office Services employee once each month, alternating assignments among the division's Mail Room, Data Depository/Service Library and Micrographics sections.

"After a while, managers tend to forget what it's really like for the people doing the job," Weber said. "This is primarily a communications effort, to help bridge that gap."

"I thought I might be a nuisance if I did it too often," he added. "By going back to each location once every three months, I may be able to do some good instead of annoying people."

He started the program by sorting, stamping and delivering mail for a day with Mail Room workers. He told Mail Room Supervisor James W. Gregory to treat him "just like a new hire" by assigning him a job like a new hire.

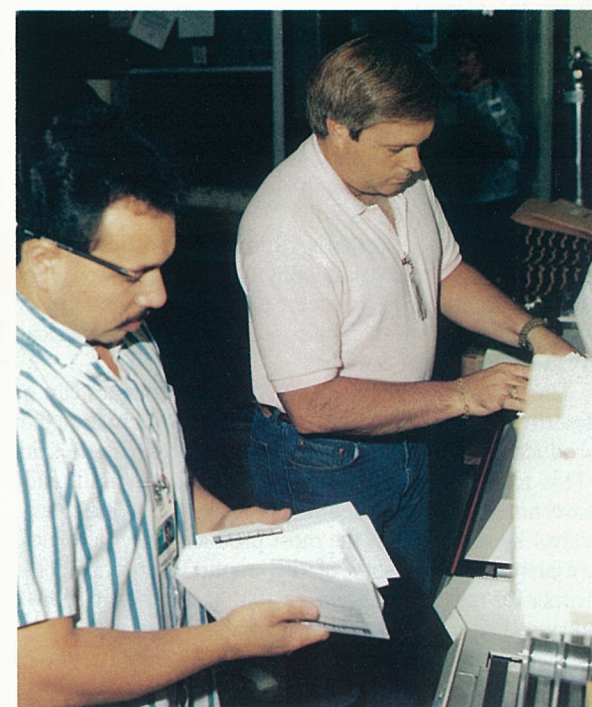
Weber said his muscles were tired and sore at the end of the shift. "Now I've got more of an appreciation for how hard the employees work and what kinds of pressures they face," he said. "They've got to move all day long, just to keep up. They do a good job."

Robert Richardson, the Mail Room's chief clerk, said Weber took his tasks seriously. "He worked all day, like a regular employee. He didn't stand around," Richardson said.

Weber noted that his idea is not original. He decided to

try it after his secretary, Pamela A. Gerth, showed him an article about an automotive industry executive who had done the same thing.

Weber said he has gotten one unexpected reaction from the program: The supervisors who report to him now want him to try doing their jobs for a day.



**Learning the Ropes.** Office Services Chief David Weber (right) sorts letters with Fort Worth Mail Room employee Alex H. Garcia.

## F-16N Base Established; GDSC Provides Aircraft Support

The U.S. Navy expanded its F-16N adversary aircraft East Coast Operation to Naval Air Station (NAS) Oceana, Va.

In anticipation of the establishment of a third operating base at NAS Oceana, several F-16N Navy adversary air-

craft from Key West, Fla., will operate as a permanent detachment at NAS Oceana.

Thirteen General Dynamics Services Company personnel are being transferred from NAS Key West to provide aircraft support at Oceana.



## Senator Sam Nunn Praises the F-16 Plant As an Efficient Factory

The Hon. Sam Nunn, U.S. Senator from Georgia and Chairman of the Senate Armed Services Committee, referred to Fort Worth's F-16 factory as "one of the very few efficient weapons systems production lines we have in this nation" during a recent visit to the plant.

Senator Nunn was speaking of cost efficiency under the current F-16 production rate, with 180 aircraft being produced annually for the U.S. Air Force. He added, however, that budget pressures will inevitably result in "stretching out" many defense programs in forthcoming proposals.

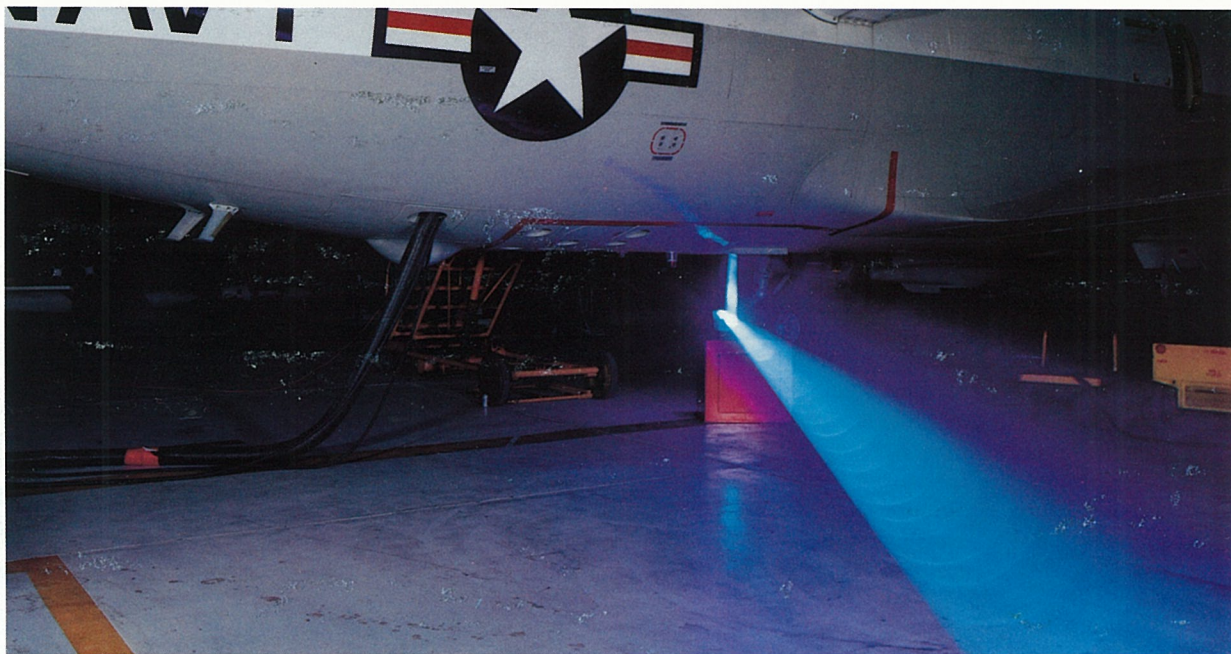
"This (the F-16) is a program that I hope we can keep at an efficient production rate," he said. "I would like to see it stay as close (to 180 aircraft a year) as possible, and certainly not drop below 150 (a year)."

Senator Nunn also mentioned the Agile Falcon co-development program, which will field an advanced version of the F-16 to meet the air combat threat of the late 1990s, as a high priority program.

The senator described his visit as "a very impressive tour of a very impressive plant — which is producing one of the finest airplanes that the Air Force has ever produced."



U.S. Senator Sam Nunn inspects an F-16



Laser Systems Laboratory's Blue Laser System on Navy P-3 Aircraft

## Laser Systems Laboratory Concludes Vital Test

General Dynamics Laser Systems Laboratory (LSL) has successfully concluded proof-of-concept tests of its blue laser system for the U.S. Navy's Submarine Laser Communications program.

The goal of the program is satellite-to-submarine communications in real time without interrupting the submarine's normal mode of operation or revealing its location. A submarine must now surface and raise its antenna above the water to establish a satellite communications link.

The problem in communicating with a submarine while it is at depth and at speed is in finding the kind of radiation that can best penetrate sea water. Water absorbs microwaves or radio waves as well as infrared or ultraviolet light not visible to the human eye. Measurements show that only blue or blue-green light radiation travels far enough to be detected in the deep ocean.

The laser system under development at LSL converts ultraviolet light from a xenon chloride laser to high-intensity, single-color, narrow-band blue laser light of the kind that can penetrate the ocean depths and be detected by an extremely sensitive light detector aboard the submarine. The receiver decodes the laser's flash patterns sent from above the ocean's surface.

Development of LSL's laser system is a key technical breakthrough for the program. The blue laser transmitter produces the correct color to be picked up by the Atomic Resonance Filter, an extremely sensitive blue light filter

that had been developed during previous Submarine Laser Communications research. The match of LSL's laser and the Atomic Resonance Filter receiver enables messages to be sent without prohibitive interference.

In May, LSL installed its laser system on a U.S. Navy P-3 aircraft at the Electro-Optical Systems facility in Albuquerque, N.M. The proof-of-concept flight tests, called Project Y-Blue, began in July. In the preliminary flight test, the P-3 sent encoded messages via the laser to two surface receivers, one on a submarine at dockside and one on the ground nearby in the San Diego area. Messages were received even through clouds and fog. During flight tests, coded messages were received by a submerged submarine at increasing speeds and depths.

LSL is continuing its laser system development with a major proposal for engineering development. The follow-on to engineering development is a true, space-based laser communication system design targeted for the mid-1990s. In such a system, satellites carrying the laser system would provide access to the vast regions of the earth's oceans where submarines operate.

General Dynamics Laser Systems Laboratory is one of several new company thrusts into high technology military applications and undersea warfare. Laser Systems Laboratory is headquartered in San Diego, with 65 employees in San Diego and 15 at its Electro-Optical Systems facility in Albuquerque, N.M.

## Scott Crossfield Boosts National Aero-Space Plane at Fort Worth

By Joe Stout

Test pilot Scott Crossfield sees strong similarities between the current program to develop the X-30 — the National Aero-Space Plane (NASP) — and the research efforts that produced record-breaking experimental aircraft in the 1950s.

Crossfield achieved acclaim more than 30 years ago when he became the first person to break Mach 2 and the first to pilot the X-15 rocket plane, which was later used to set speed and altitude records.

He visited Fort Worth's NASP program office recently in his official capacity as congressional advisor to the House Committee on Science, Space and Technology. He was in town to speak at a conference of the American Aviation Historical Society.

The current development of X-30 technologies can be described as a continuation of the research technique that produced the X-15 and earlier X-planes, Crossfield said. "This technique truly characterized military/industrial/government cooperation at its best, with all working as a team," he said. "It was the most productive technological initiative in the history of this country, producing the primer for most of the scientific data being used in today's advanced aircraft and space programs."

In its final years of flight, the X-15 reached altitudes of 67 miles — technically in space — and speeds greater than Mach 6.7.

"That experimental technique declined after the creation of NASA and after 1960," he said. "The emphasis moved from a total approach including airplanes, flying within the atmosphere, to emphasis on strictly space vehicles."

"With the X-30 program, we have recovered from that error and we're trying to get back into the research airplane mode."

General Dynamics is one of five companies working on preliminary design contracts for the X-30. The aircraft is conceived as an experimental vehicle with the capability to take off from a conventional runway, fly at hypersonic speeds up to Mach 25, ascend directly into orbit and then return to Earth and land on a runway.

The technologies to be developed and proved in the X-30 effort will spawn derivative aircraft with a variety of different missions made possible by hypersonic flight and routine, relatively low-cost access to space.

Crossfield said the concept complements the current U.S. Space Policy goal of achieving a permanent, manned American presence in space. "We'll do that with the Space Station," he said. "But the Space Station requires a reliable, cost-effective way to access it. We will have that with derivatives of the X-30."

He said it is imperative that the technologies for hypersonic and routine transatmospheric flight be developed with a research aircraft, rather than one intended for a specific mission. "If you already know what the technology is, you don't have to pay the terrible price of developing the technology and the (specific mission) vehicle at the

same time," he explained.

Crossfield said "every facet of aerospace . . . would be importantly impacted by the successful accomplishment of the X-30 program." Applications of the new technologies would be seen in every area, from General Aviation to space flight, he said.

"Already, the return from studies on the X-30 have made a tremendous, profitable payoff for the aerospace community," he said. "We have opened up a whole new area in materials development."

The X-30 requires advanced materials that are very light yet very strong at high temperatures. The competing contractors — three airframe companies, including General Dynamics, and two engine companies — are pooling data gained in advanced materials research in an unprecedented cooperative development effort. General Dynamics is concentrating on research with carbon-carbon materials.

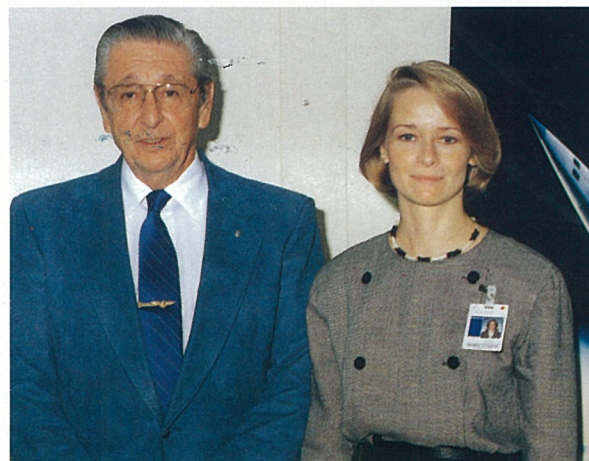
"The materials consortium seems to be working quite well," Crossfield said. "It's a good national effort. Of course, all of the companies are smart enough to realize that they will all benefit."

Crossfield has received X-30 briefings at the facilities of other participating companies, as well as at Fort Worth. He commented that General Dynamics is a "powerful participant and contributor" to the effort.

Fort Worth is being assisted by Space Systems and Convair in the program.

The first man to travel twice the speed of sound is openly excited about the X-30. "We're getting back to the technology that was allowed to lay fallow for more than 20 years," he said. "The potential of this program to create new jobs, prosperity, industrial growth and national prestige . . . is just mind-boggling."

"Not only am I excited about it, but I'm convinced that if we don't go forward with the program we're going to become a second-class technical nation," he said. "It would be the gravest error of our times to sit back and just put ourselves in the international bleachers (in aerospace technology) by not assuming the leadership that is rightly ours."



**X-30 Program Briefing.** Veteran test pilot Scott Crossfield with Fort Worth engineer Vicki A. Kygar. Kygar was recently honored for her outstanding technical contributions to the X-30 program by Dr. Robert R. Barthelmy, Director of the NASP Joint Program Office at Wright-Patterson AFB, Ohio.



## Community Relations Video by Pomona, Valley Systems Is Cited By Jerry Littman

A videotape produced by the Valley Systems and Pomona divisions as a community relations project has received recognition for its excellence.

The video, "To Fly Again," produced for Casa Colina Centers for Rehabilitation, features Mike Smith, who survived nearly 600 hours of combat flying in Vietnam and was later injured in a helicopter crash in Southern California. The video traces Smith's life from Vietnam to his rehabilitation therapy at Casa Colina.

The video tied for third place in a national competition sponsored by *Industrial Photography* magazine.

The video was produced by Kevin Cryan, Supervisor, Film and Television, assisted by Glenn Dodge, Director; Darrin Pierce, Cameraman/Editor; Lawrence DePaula, Cameraman/Soundman; and Clinton Comerford, Writer, all of Valley Systems. Funding for the project was provided by Pomona.

Pomona and Valley Systems have supported the work done by Casa Colina Rehabilitative Hospital for many years. The video is intended to inform the public about Casa Colina's capabilities and results of its work, and to support the hospital's fund-raising efforts.

Casa Colina, a not-for-profit organization, is guided by boards of directors from the community who volunteer their expertise. It serves more than 10,000 disabled persons annually, and the outstanding results of its work have made it highly recognized among rehabilitative institutions.

General Dynamics has long supported the facility and many employees and members of their families have used the services.

In addition to monetary contributions and such assistance as production of informational slide programs, films and videotapes, General Dynamics also supports Casa Colina on an employee volunteer level. Three Valley Systems employees serve on boards for the organization: W.P. Wylie, Director-Administrative Services, is Vice Chairman of the Board of Casa Colina, Inc.; Dave E.



**Award-winning Video.** "To Fly Again," the story of the rehabilitation of Mike Smith (right), made by Valley Systems and Pomona divisions for the Casa Colina Centers of Pomona, tied for third place in a national competition sponsored by *Industrial Photography* magazine. The video crew includes (standing, from left) Lawrence DePaula, Cameraman/Soundman; Glenn Dodge, Director; and Clinton Comerford, Writer. Kneeling is Darrin Pierce, Cameraman/Editor. The video was made as a community relations project and is being shown to encourage support for the Casa Colina Centers.

Cumbie, Director-Cost Competitiveness Advocate, serves on the Board of Casa Colina Centers for Rehabilitation, Inc.; and James L. Gilkerson, Manager-Public Affairs, serves on the Board of Trustees of Casa Colina Foundation.

Since the accident and his therapy, Smith has earned a

Bachelor of Arts degree in Recreation Administration and regained his rating as a certified pilot instructor. "To fly again was one of my highest priorities," he said. "I had always loved flying and really missed it. And now that I'm back in the air, I find it just as exciting."

## Sailors Who Launch Tomahawks Get to Look at Them Close Up By Julie C. Andrews

By the time a Tomahawk cruise missile is delivered to a Navy submarine, it is invisible inside its steel capsule. Surface ship and submarine sailors who "push the button" to launch Tomahawks are now getting a chance to see the missile up close through a series of Tomahawk production tours sponsored by Convair's Marketing department and the Tomahawk Program Office.

The tour groups have also included Navy fire control technicians who instruct the crews and officers of Navy vessels equipped with the Tomahawk and other missile systems. These instructors and shipboard personnel are all key to Tomahawk's operations.

"Because we are located in San Diego, a major naval port, we have a unique opportunity to support local Navy activity and provide a broader dimension of training for the using personnel," said Robert J. Gregory, Sea Launched Cruise Missile (SLCM) Marketing Manager.

"Some of the visiting crews are from ships that have been undergoing overhaul here in San Diego," he said. "Part of that overhaul involves installation of Vertical Launch System (VLS) equipment."

Tomahawk ship VLS capability became operational this year, with submarine VLS scheduled to become operational early next year. Those crews have been attending VLS training at the Fleet Combat Training Center-Pacific (FCTCPAC) in San Diego concurrent with overhaul activity.

FCTCPAC is a training command for "Tomahawk shooters," Navy personnel responsible for launching Tomahawk and maintaining the system on board. One of the visits involved 15 instructors from FCTCPAC along with commanding officer Capt. Thomas J. Barnett. FCTCPAC trains nearly 200 Navy personnel per year in Tomahawk launch capability.

Three crews have visited Convair's Tomahawk production area since April: USS *Hewitt*, USS *Elliot* and USS *Chicago*. *Hewitt* and *Elliot*, both *Spruance*-class destroyers home-ported in San Diego, were being outfitted with VLS

equipment. A group from the submarine USS *Chicago* also included personnel from Submarine Group Five based in San Diego. Tomahawk is currently deployed on 26 surface ships with a planned 91 ship deployment and on 34 of a planned 107 submarines.

In July Rear Adm. Frank R. Donovan, Commander - Amphibious Group Three, headed a group that visited Convair to view production and to discuss future applications of Tomahawk as it relates to their mission.

"Navy personnel already have knowledge of Tomahawk capabilities, so they are curious to see the insides of the missile and how it is put together," said Douglas C.

Steudler, Convair Marketing Representative, who helped set up the tours.

The production tour includes Convair innovations such as the automated warehousing facility and the "paperless factory." The factory does away with all paper-based planning and work instructions through the use of computer screens in the final assembly area.

The Navy groups also watch demonstrations of the automatic testing systems and visit the environmental test chamber as well as the Tomahawk maintenance area, where missiles coming back from the fleet are refurbished and recertified.



**Navy Personnel on Tour.** Capt. Thomas J. Barnett (in khaki uniform) and Navy instructors look at Tomahawk tail section. Douglas C. Steudler, Convair Marketing Representative, is at far right.

## Company Acquires License for Advanced Electric Voltage Technology

General Dynamics has acquired a license to use an advanced technology that regulates and meters ultrahigh electrical voltage into precise nanosecond bursts or pulses.

The new technology uses an innovative electrical switch developed by Quantum Diagnostics, Ltd., of Hauppauge, N.Y. The device, called a "Pulsatron" switch, is expected to have important applications in microwave and high-energy technologies.

"Electronics technology evolves rapidly from year to year and we believe Pulsatron applications will help keep us in the vanguard of military defense electronics," said J. Clifford Schoep, Corporate Director-Research and Advanced Development.

"The license was acquired in the long-range interests of our research and development programs," Schoep said. "We see the possibility of important applications in

products and technologies under development or consideration by General Dynamics."

As part of the Pulsatron license agreement, General Dynamics has acquired a limited right of first refusal on the licensing of other patented technologies developed by Quantum Diagnostics. The agreement also includes unregistered warrants for General Dynamics to purchase 350,000 shares of Quantum Diagnostics common stock.



## Navy Honors Tovar With Its Distinguished Public Service Award

Fritz G. Tovar has been presented with the U.S. Navy's Distinguished Public Service Award, the Navy's highest honor given to a civilian.

Tovar, who in September retired from his position as Vice President and General Manager of Electric Boat, received the award Oct. 7th from Everett Pyatt, Assistant Secretary of the Navy-Shipbuilding and Logistics.

Tovar was cited for "distinguished technical and managerial service to the U.S. Navy from December 1977 to September 1988 in nuclear submarine design and construction." During that time, Tovar served first as General Manager at Electric Boat's facility in Quonset Point, R.I., and later as head of the division's main plant in Groton.

According to the citation, the award recognized Tovar's leadership and technical expertise in the timely delivery of submarines. His pioneering efforts in modular construction and other submarine production methods increased productivity and quality and helped to accelerate schedules and reduce costs.

Pyatt noted that Tovar's performance "has been of exceptional value and benefit to the Navy and reflects great credit upon him and the Electric Boat Division of General Dynamics."



**Top Award.** Everett Pyatt, Assistant Secretary of the Navy-Shipbuilding and Logistics (right), congratulates Fritz Tovar for being given the Navy's Distinguished Public Service Award.

## Space Systems Wins USAF Study Contract For Launch Complex

Space Systems has won a \$2 million study contract from the U.S. Air Force to develop a new West Coast Titan IV/Centaur launch complex at Vandenberg AFB known as SLC-7 (Space Launch Complex 7).

Space Systems is teamed with Bechtel National, Inc., which will design the facilities. Space Systems will be responsible for the study integration and developing the ground equipment concepts.

The SLC-7 study will be conducted over the next several months at a newly established office in Santa Maria, Calif., just outside of Vandenberg. Phase II will be announced late next year and will provide the Air Force with a down-select to one contractor who will then design and build a turnkey, modern launch site.

Space Systems is building 10 Centaur upper stage vehicles for the Air Force's Titan IV program. Titan IV will launch from the new SLC-7 at Vandenberg as well as launch facilities at Cape Canaveral Air Force Station, Fla.

A total of 271 Atlases have been launched from Vandenberg, but Centaur upper stages have always been launched from Cape Canaveral in conjunction with the Atlas or Titan III boosters. When Titan IV becomes operational, it will mark the first time Centaur has flown from a West Coast launch site.

David A. Patterson is leading the Space Systems SLC-7 study team consisting of personnel from San Diego, Vandenberg and Cape Canaveral. Ronald P. Cope, the Bechtel National, Inc., Program Manager, is leading its team consisting of personnel from Vandenberg and San Francisco.



**Abilene North Inauguration.** Photographers get ready as William J. White, Abilene General Manager, prepares to cut the ribbon to officially open the new North facility. White is flanked by Gary L. West, Executive Director of the Abilene Industrial Foundation (left), and Charles L. Dromgoole, Executive Vice President of the Abilene Chamber of Commerce (right). Other Chamber of Commerce representatives, wearing red coats, are in background.

## New Abilene Production Operation Inaugurated As Employees, Community Join in Ceremony

More than 3,000 Abilene Facility employees, their family members and citizens of West Texas recently marked the inauguration of a new General Dynamics production operation in Abilene.

The local community joined the company in welcoming the new location, called the North facility, with a ceremony and open house.

The facility, which began production earlier this year, assembles alternate mission equipment and mission support equipment for the F-16 Fighting Falcon. The location was fully staffed and operational as of last month.

Alternate mission equipment includes such items as weapons pylons, fuel pylons and missile launcher adapters. Mission support equipment includes maintenance trainers for the ejection seat, canopy, fuel and gun systems, as well as electrical test sets, engine dollies and other hardware.

William J. White, Abilene Facility General Manager, praised employees, local Chamber of Commerce officials

and the people of Abilene for their assistance in supporting the addition. "The employees at our existing facility have an excellent reputation of producing quality products on time and within budget," he said. "That reputation had an impact upon the decision to locate this work here. When we announced that the facility would be located here we had more than 4,000 applicants for new jobs."

Abilene is in an area of Texas where the economy has depended heavily on the oil industry.

Abilene's original West facility is primarily a machining center that supports other divisions by producing components for the F-16, Tomahawk, Phalanx and the MD-11 airliner, built by McDonnell Douglas.

Employees at the West location recently celebrated two years of shipping 100 percent of all parts ordered. General Dynamics has operated the Abilene Facility since February 1978.

## General Dynamics Employees Are Role Models

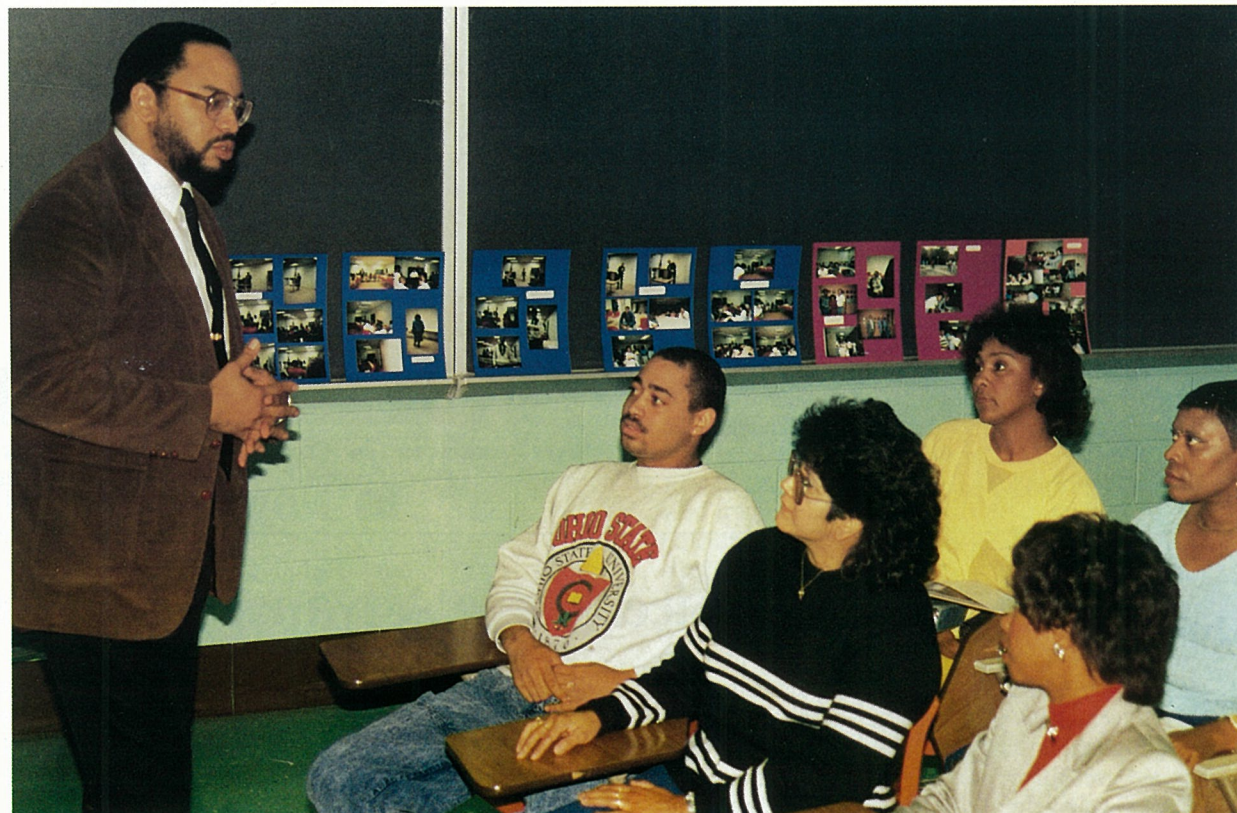
William H. Towns, Facility Manager in the Data Systems Division, has been named the first Role Model of the Year at an appreciation and recognition dinner given by the Lima Role Model Program.

Towns is one of four employees of the Lima (Ohio) Army Tank Plant who are serving as role models for minority students at the Lima Technical College and the Ohio State University campus in Lima. Others taking part in the program are Samuel M. Taylor, Senior Analyst in Industrial Engineering; Dianthia L. Wilson, Senior Analyst in Production Planning; and Linda M. Washington, Supervisor in Quality Assurance Administration.

Lima employees have been involved in the Role Model Program since its inception in 1986, helping minority students develop positive self-images and attitudes and provide career and occupational insights.

By sharing their experiences and showing that they care, the role models reduce feelings of isolation and often can make the difference whether or not a student continues in college.

School administrators are planning to expand the successful program to include field trips, scholarships, cooperative work and a visiting instructors program.



**Experience Counts.** As a role model on the Lima Technical College and Ohio State University campus in Lima, Ohio, William H. Towns, Facility Manager in the Data Systems Division at the Lima Army Tank Plant, shares his experiences with minority students.





## Season's Greetings



Dear Employees:

*This is the time of year to pause, to think, to consider.*

*As passengers aboard planet earth, hurtling through space at 70,000 miles per hour, we go our individual and collective ways in a multiple array of human activities.*

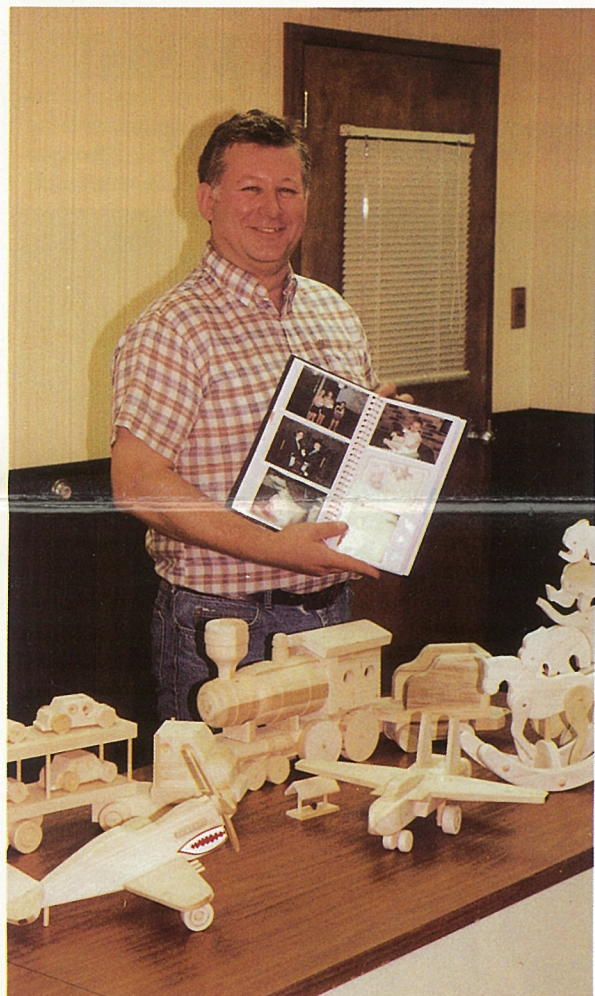
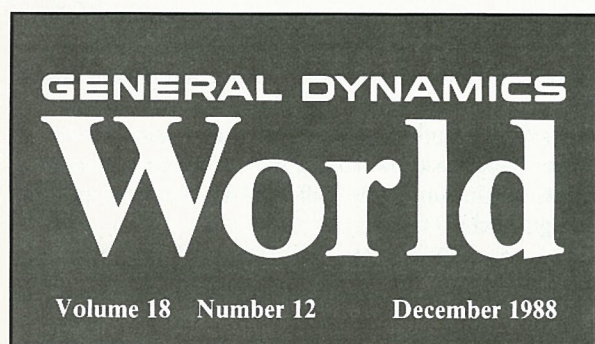
*Periodically, such as now, we take time out to observe days of tradition or custom — some patriotic and of recent invention, others with more deep-rooted religious significance. We exchange gifts, we make extra efforts to accommodate others, and we try to be more helpful and understanding.*

*For many, extra effort isn't restricted to the holidays. In fact, as I start my fourth year as your Chairman and CEO, I continue to be greatly impressed by the increasing number of our employees who regularly spend so much of their personal time in helping others to deal with a variety of individual or family*

*problems. The stories of some of these employees are told in a new brochure now being distributed by our Communications Department — and there are many others who deserve similar recognition.*

*To all of them, and to all of you in the General Dynamics family who go from day to day doing your best, I extend my thanks and most sincere best wishes for a Happy Holiday. I'm glad to be a part of this team. It's a winner!*

Stanley C. Pace  
Chairman and Chief Executive Officer



**Scrapbook of Smiles.** Walter (Skip) Lindemuth, a machine operator at the Land Systems Scranton Plant, shows some of the toys he plans to give to children in his neighborhood in exchange for pictures of them with the toys that he puts in his scrapbook.

## Employee Donates Hand-Carved Toys As Christmas Gifts

A Land Systems employee at the Scranton Plant is filling a scrapbook of smiles for the wooden toys he makes and gives to children in his neighborhood.

Walter (Skip) Lindemuth, an operator of a computer numerically controlled machine in Gun Shield and Housings, carves the toys and then gives them to children whom he asks to pose for a picture with the toy.

Lindemuth puts the picture in his scrapbook, which is filling up with pictures of children of all ages posed with trains, airplanes, wooden puzzles and a host of other top quality toys.

Lindemuth also donates a 10-piece wooden train and several other toys to the Scranton Masonic Temple and Scottish Rite Cathedral Ladies Auxiliary each Christmas. By raffling off the toys, the group has raised several thousand dollars for charity over the past years.

In addition, for the past three years, Lindemuth has brought to work a bag of about 400 handmade Christmas tree ornaments that he gives to other Scranton employees.

## At Christmastime, Electronics' John Kenney Is Widely Known As Mr. Teddy Bear

By Julie C. Andrews

His Electronics Division badge identifies him as John Kenney, but to his friends, coworkers and a lot of San Diego kids, he is Mr. Teddy Bear.

Every Christmas for five years, Kenney has mounted a toy drive for the Hillcrest Receiving Home in San Diego. Last year, he added the Child Protection Center of San Diego Children's Hospital.

"Five years ago I started out with four departments," said Kenney, a custodian at the Kearny Mesa facility of Electronics. "The first year I collected about 100 stuffed teddy bears. The next year, I added two more buildings and collected 350 toys. The third year we added another building plus the people at the Lindbergh Field facility. Last year Data Systems Western Center joined in, and this year everybody is helping."

Forty collection points at various locations at Electronics, Convair, Space Systems and DSD-Western Center were set up immediately after Thanksgiving. Kenney's goal is to collect 2,000 toys this year. With help from the Shipping and Receiving Department, Mr. Teddy Bear will deliver them in time for Christmas.

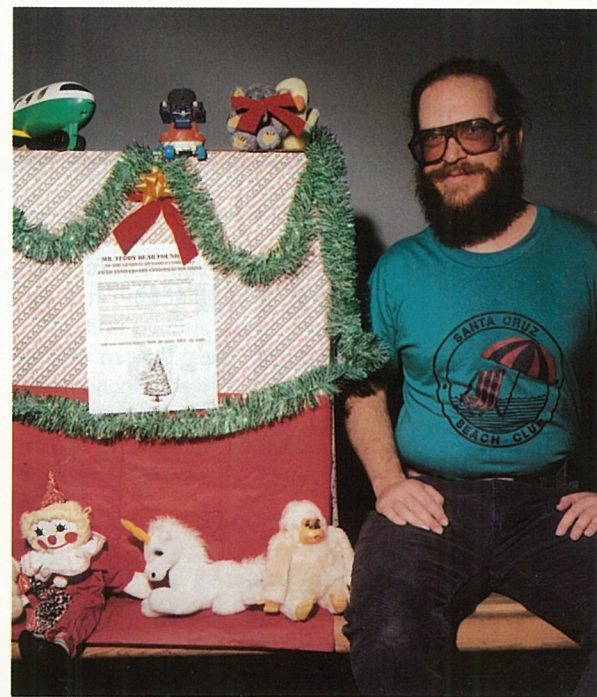
Kenney first found out about Hillcrest Receiving Home when a child he knew was admitted after being abused by a parent. The home is a state-funded center for children who come under the protection of the legal system.

Kenney's motivation for the kids is simple.

"One word sums it up — love. Those kids need to know someone out there cares about them," he said.

The children who cycle through the receiving home and the Children's Protection Center are often the victims of horrifying crimes. Kenney has been able to build trust with the staff of both centers whose mission it is to protect the children at all cost.

Kenney's dream is to see his toy drive grow. He has



**Annual Toy Drive.** Every Christmas, John Kenney of Electronics Division spearheads a toy drive for abused children in the San Diego area.

expanded his efforts into collecting candy at Valentine's Day and Easter. Meanwhile, Mr. Teddy Bear hustles during December, working with 10 people who are helping him coordinate this year's drive.

"With 16,000 employees in San Diego, just think of how many toys we might be able to collect," Kenney said.

## Hellenic Air Force Receives Its First F-16

By Joe Stout

Greece became the 14th nation with the F-16 in its inventory when the Hellenic Air Force (HAF) officially received its first Fighting Falcon in ceremonies at Fort Worth in November.

Brig. Gen. George Banakos of the HAF General Staff accepted the two-place F-16D on behalf of his nation. It is the first of 40 Fighting Falcons — six F-16Ds and 34 single-seat F-16Cs — that Greece will receive through October 1989.

His Excellency George E. Papoulias, Ambassador from Greece to the United States, said the country's F-16s will make a major contribution to the defense of Greece and

NATO. "Apart from the fact that this procurement enhances and promotes the cooperation between Greece and the United States, we fully appreciate that the F-16 is one of the most up-to-date, state-of-the-art weapons systems in the world," he said.

The U.S. Air Force was represented by Brig. Gen. Donald L. Kaufman, Director of International Programs at USAF Headquarters. General Kaufman said the F-16 "is a pleasure to handle on the ground as well as in the air," referring to the high maintainability of the aircraft.

(Continued on Page 2)



**First F-16 Produced for the Hellenic Air Force Is Shown on Its Initial Flight**



# Herb Ellis Would Have Enjoyed This Weekend at Georgia Tech By Joe Stout

Everyone involved said it was a weekend the late Herb Ellis would have thoroughly enjoyed: a gathering of his family and friends, a brief ceremony and, to top it off, a Georgia Tech homecoming football game.

Georgia Tech recently dedicated the Herbert L. Ellis Room in its Cooperative Education Department in memory of the General Dynamics employee who recruited engineering graduates at the university for 23 years.

The dedication was attended by several members of Ellis' family, including his wife, Jo Ellis, and his four children.



Ellis, who was Corporate Manager of College Relations at the Corporate Office, died of cancer a year ago at the age of 49. He had been with the company 24 years, most of them at Fort Worth.

The new room and a Cooperative Education Associate Director's position are being funded with gifts from General Dynamics and several other companies that recruit at Georgia Tech. "The contributors agreed that the room should be named for Herb, which speaks very well of the regard that his colleagues and the Georgia Tech

community had for him," said Barbara W. Bormann, Fort Worth Engineering Specialist.

Ellis recruited Bormann, current captain of the company's Georgia Tech recruiting team, from the Atlanta campus several years ago. She and the other recruiting team members attended the dedication along with Michael C. Lucero, Corporate Director of Personnel Planning and Placement, and Jerry A. Sills, Fort Worth's Ethics Program Director and General Dynamics' Georgia Tech executive liaison.

Ellis' family members, coworkers and friends shared their memories of him during the weekend's events, and the occasion was anything but somber, Bormann said. "Herb had some memorable traits. He took kidding about them good-naturedly, so I think he would have enjoyed the discussion," she said.

Bormann said that Ellis was "probably one of the most organized people in the world." His desk was always in perfect order with every paper clip, pen and piece of paper neatly placed in its prescribed position. "I was meeting with him in his office once when he had to take a phone call," she said. "I turned one of his pencils around when he wasn't watching. When he turned back around and we continued our meeting, it just about drove him crazy that something was out of place."

Also remembered were Ellis' perfectly shined shoes. "We sometimes had activities that called for casual dress when

we were on the university campus," Bormann said, recalling the years that Ellis was captain of the Georgia Tech recruiting team. "To Herb, 'casual' meant pressed jeans, a starched and pressed button-down collar shirt and shiny loafers".

Ellis was known on campus for his sense of humor. He had a long-standing goal of recruiting George P. Burdell, a mythical student whose name has been appearing on Georgia Tech rosters, registration forms and even completed exams since 1927.

Ellis' associates arranged a "birthday" surprise for him with singing restaurant waiters during each of his semi-annual recruiting trips to Tech. After many years and twice as many birthdays, he told associates he was getting too old for the trips to Georgia Tech, which he enjoyed as much as anything he did in his job, Mrs. Ellis said.

"Georgia Tech was always an important part of Herb's life, from the days when he used to go to the campus as a boy to watch football practice," Mrs. Ellis said. "He would be very happy to know that the memory of his professional efforts at the university will now be a lasting part of Georgia Tech."

Ellis joined the company at Fort Worth in 1963. He transferred to the Corporate Office in 1986 and died in November 1987.

## Hellenic Air Force Receives First F-16 Of Total Order of 40

(Continued from Page 1)

The audience included more than 70 HAF technicians who are receiving F-16 maintenance training at Fort Worth, and six pilots being trained by the USAF at Luke AFB, Ariz. Greece's first F-16s will remain at Fort Worth until early 1989 to support the training program.

James R. Mellor, Vice President—Marine, Land Systems and International, and Charles A. Anderson, Vice President and Fort Worth General Manager, represented the company.

The audience also included several hundred Air Force, subcontractor, government and General Dynamics representatives who have played a part in the Greek F-16 program.

The government of Greece announced its selection of the F-16 in November 1984. The HAF airplanes are powered by the General Electric F110 engine.

Greece is the first nation to purchase F-16s through a direct commercial sales agreement, as requested by the country. Most international customers have purchased the aircraft through government-to-government sales.

## Navy League Presents Roosevelts Gold Medal To Electric Boat for Achievement in Science

Electric Boat, which developed major design and construction improvements of the Trident submarine, received the Roosevelts Gold Medal for accomplishments in science at the 84th anniversary dinner of the Navy League of the United States, New York Council.

In addition, Chairman and Chief Executive Officer Stanley C. Pace was presented the Admiral John J. Bergen Award for Industry as the guest of honor of the Nov. 14th dinner.

The Roosevelts Gold Medal is awarded by the Navy League "for extraordinary contributions through science to the security of America." Electric Boat has had an exemplary record of early deliveries of Trident ballistic missile and SSN 688-class fast-attack submarines. It has delivered seven of the last eight Trident submarines ahead of schedule and has played a significant role in six of the eight major subsystems of the Trident program.

In its program, the Navy League stated that Electric Boat and the division's longtime former Vice President and General Manager, Fritz G. Tovar, have demonstrated that "management is both a science and an art."

New Electric Boat Vice President and General Manager James E. Turner accepted the award for the division.

Before the Trident program, the Navy performed its own design and development with support agencies such as Electric Boat. With the Trident's new engineering concept, the division has become the systems developer and systems manager. Through its extensive planning and engineering capability, Electric Boat has responded to major design and construction improvements, incorporating them into submarines, yet minimizing impact to the Trident program schedule. Installation of the D5 missile in the Trident is an example.

Ballistic-missile submarines provide about half of the nation's strategic warheads for less than four percent of the strategic defense budget.



**Navy League Honor.** Vice President and Electric Boat General Manager James E. Turner wears the Roosevelts Gold Medal at the recent Navy League dinner.

## FS-X Agreement Signed by Japan and U.S.

The United States and Japan have signed an agreement establishing terms for development of the FS-X fighter/support aircraft for the Japan Defense Agency.

General Dynamics is the major U.S. subcontractor for the program, with Mitsubishi Heavy Industries of Japan

acting as prime contractor. The aircraft will be developed as a derivative of Fort Worth's F-16.

Japan selected the F-16 as the basis for its FS-X in late 1987. The new aircraft will be produced in the late 1990s.

## A-12 Team Is Awarded USAF Study Contract

The General Dynamics/McDonnell Douglas A-12 team has been awarded a \$7.9 million contract for a Concept Definition Study of an Air Force version of the Navy's Advanced Tactical Aircraft.

The team will perform a U.S. Air Force A-12 program definition study over an 11-month period.

This contract represents a major milestone towards cross-service utilization of the Navy A-12 and marks the beginning of the USAF A-12 program.

Results of this study will help the Air Force further define its A-12 program and formulate a baseline A-12 configuration for the Tactical Air Forces.

Savings and Stock Investment Plans			
Annual Rate of Return for the 12 Month Period Ending:			
	Oct. 1986	Oct. 1987	Oct. 1988
<b>Salaried</b>			
Government Bonds	12.5%	5.5%	7.7%
Diversified Portfolio	37.7%	7.6%	13.2%
Fixed Income	12.0%	11.6%	10.8%
<b>Hourly</b>			
Government Bonds	11.9%	5.7%	7.9%
Diversified Portfolio	38.3%	8.5%	13.3%
Fixed Income	12.0%	11.7%	10.7%
GD Stock Closing Price	\$72.75	\$50.00	\$53.50

**GENERAL DYNAMICS**

# World

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Contributors: Julie Andrews, Graham Gavert, Don Gilleland, Myron Holtzman, Dean Humphrey, Jack Isabel, Dave Lange, Jerry Littman, Jack Price, Tom Rule, Chris Schildz, Joe Stout, Joe Thornton



# Recognition Programs Are Important Employee Incentives By Myron R. Holtzman

Awards ranging from merchandise and savings bonds to vacation packages and educational stipends are important incentives in the more than 330 programs established within the General Dynamics community to recognize employees' superior work performance.

The recognition programs, which have been established for both salaried and hourly workers corporatewide, cite outstanding contributions toward innovation and cost reduction.

"These are programs to let our employees know that they're appreciated," said Arch H. Rambeau, Corporate Vice President — Human Resources. "The consensus is that there should be recognition for efforts above and beyond regular job duties and these programs address those concerns."

Luncheons and dinners, movie tickets and savings bonds . . . cash, pen and pencil sets and weekend vacation packages . . . plaques, gift certificates, sculptures and statues. The awards are as varied as the types of work done throughout the company.

For example, in an effort to encourage employees to work toward doctoral degrees and to assist the division in developing high technology competence, Pomona and Valley Systems offer a \$10,000 annual stipend, full tuition, books, dissertation final typing and binding expenses and full company benefits in a doctoral fellowship award program.

Several divisions, including Convair, Data Systems, Electric Boat, Electronics, Fort Worth, Pomona and Valley Systems, are involved in a program designed to improve productivity and employee safety and reduce costs.

The Pacesetter Award at Space Systems recognizes a performance by an hourly employee, as well as a group achievement, that has contributed to quality or product improvements that exceed normal job requirements. Merchandise is awarded to the winners.

Another of the awards is Pomona's Breakthrough Award, which recognizes individuals who, by their own

## General Dynamics Recognition Programs

The following information indicates many of the divisional programs and types of recognition awards in the categories listed.

Category	No. of Programs	Recognition
Recognition of employees for special achievement, innovations, contributions or performance.	107	Plaques, Savings Bonds, Merchandise, Luncheons, Dinners, Certificates
Recognition of employees for cost reduction initiative & quality improvement.	63	Merchandise, Luncheons, Dinners, Letters of Recognition, Cash, Savings Bonds, Plaques
Recognition of employees for special educational achievement and advancement potential.	68	Tuition Refund, Attendance at seminars, Luncheons, Certificates
Recognition of employees for achieving individual or group attendance, safety or security performance.	24	Merchandise, Luncheons, Dinners, Savings Bonds
Recognition of employees for community achievement.	16	Merchandise, Luncheons, Plaques, Certificates

innovation, perform a service or action that has a dramatic, positive effect on the division. The award is a beautiful glass sculpture.

At Fort Worth, a salaried (exempt/non-exempt) employee can also be rewarded for making a special contribution/effort in completion of a difficult job.

Meanwhile, Land Systems offers a Good Samaritan Award, which presents a savings bond to individuals who

have taken a significant, positive action to aid their fellow workers during an emergency situation.

Several seminar programs, exposing employees to corporate management, are also available as is the Service/Retirement Award, which presents pins, watches and merchandise to retirees.

For further information concerning awards at your division, contact your Human Resources Department.

# Company Institutes Community Service Award Program for Employees

General Dynamics employees are a vital link between the company and the community — as team members in company-sponsored programs, and as individuals volunteering their time and talent to a variety of organizations.

To recognize the contributions its employees make to educational, civic and community service organizations, General Dynamics has instituted a Community Service Award Program at major company locations. The award, which will be given annually to division/subsidiary employees, includes a \$1,000 contribution in the recipients' names to the organizations for which they volunteer.

Full-time employees, as well as those retiring during the year, are eligible to participate. Nominations may be made by the nominee or a fellow employee. In either case,

adequate details of the nominee's activities must be provided.

To be eligible for the \$1,000 contribution in the employee's name, the organization must be an educational institution or a nonprofit organization classified by the Internal Revenue Service as a community/social group that has a tax-exempt status under IRS Code Section 501(C)(3).

Employees must submit completed nomination forms and supporting documentation to the division or subsidiary Community Relations Manager by Jan. 31st in order to be considered for the 1988 award. Applications will be reviewed by the Community Relations advisory committee from each division with final selection of one deserving

employee in each division by March 31st. The winners will be announced at annual award ceremonies during National Volunteer Week in April or May.

William B. Pedace, Corporate Director-Community Relations, said that nomination forms are available from division Community Relations Managers or by calling Pedace at (314) 889-8442.

Eligible General Dynamics Operations include: Cessna, Convair, Corporate (including Washington Office), Data Systems, Electric Boat, Electronics, Fort Worth, General Dynamics Services Company, Land Systems, Material Service, Pomona, Space Systems and Valley Systems.

# European Engineers Working at Fort Worth Have to Go Home to See a White Christmas

"Christmas at home" will mean a cozy fire in Northern Europe for a number of European engineers working on Fort Worth's Agile Falcon and F-16 Mid-Life Update (MLU) programs. The Christmas holidays will provide the first chance they have had to return to their homelands since becoming temporary Texans earlier this year.

Thirteen engineers from the Netherlands, Denmark and Belgium are participating in preliminary design of the advanced F-16 derivative for the mid-1990s. The first Norwegian and 10 to 15 additional European engineers are expected through 1989. They began arriving in Fort Worth in July.

Most are looking forward to observing a traditional European Christmas and enjoying winter weather for a few days. Winter in Texas is relatively mild, with the last appreciable snow on Christmas Day in Fort Worth falling in 1926.

Jorn Abrahamsen, who will celebrate Christmas in his hometown of Malov, Denmark, said Christmas Eve is the main day for holiday festivities in his country. Families usually select and cut a live Christmas tree, visit loved ones and attend evening religious services on Dec. 24th.

"We exchange gifts later at night, after church and some good food," he said. The tree is usually trimmed with homemade decorations and lighted candles, he added.

Abrahamsen, who is working on Agile Falcon and MLU avionics at Fort Worth as an employee of the Danish firm Nea-Lindberg, said he may take his father a cowboy hat for Christmas.

Peter Geerlings of Heemstede, the Netherlands, also

will attend a family gathering on Christmas Eve. "We won't have any big gifts, though," he said. "My family usually exchanges gifts on the 5th of December, when we have Santa Claus Feast in the Netherlands."

However, Geerlings said his family has a Christmas tradition of exchanging small presents that relate to something the recipient has done in the past year. If a relative moved to a new home, for example, Geerlings would make that person a small replica of a house and present it while reciting an original rhyme. "It's fun, because some of my sisters and brothers-in-law are very creative at making rhymes," he said.

Michel Sander, a resident of Blegny, Belgium, and an employee of SONACA, will celebrate Christmas at home with his wife and three children. Sander's family remains in Belgium while he works at Fort Worth on intermittent assignments lasting several weeks at a time.

"Christmas is one of the biggest events of the year," he said. "The traditions in Belgium are close to those in the United States, with emphasis on things taking place in the home."

All members of the family exchange gifts on Christmas Eve, he said.

Another gift-giving occasion, St. Nicholas Day on Dec. 6th, is reserved for giving gifts to children, Sander explained.

"A lot of times, we have snow on Christmas and it looks beautiful outside," he said. "You can have a better feeling of what is meant by 'home,' because it is so cold. Home is really home at that time."

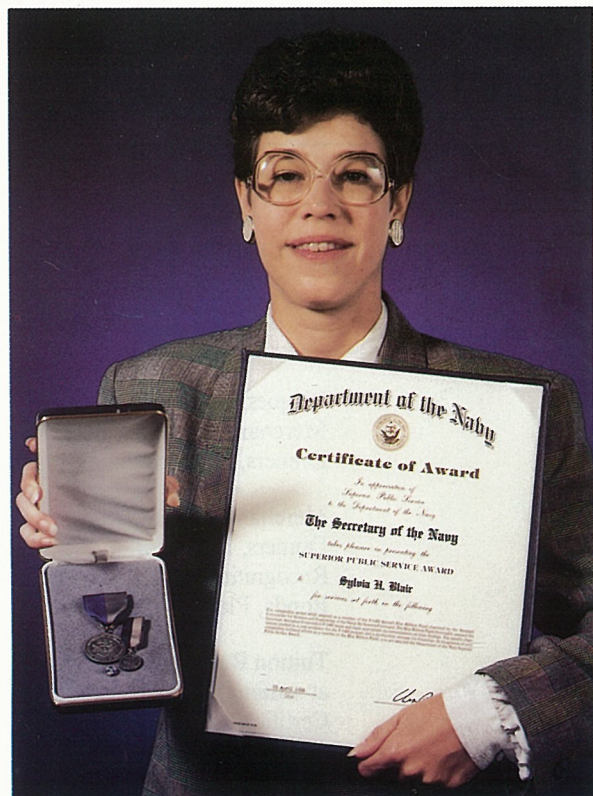


**Executive Knighted.** Charles E. Seeger, Pomona's Vice President of Quality Assurance (left), receives the Silver Knight of Management Award from Ed Jones, President of the Pomona chapter of the National Management Association. The award is the highest an NMA chapter can bestow on an individual and recognizes outstanding leadership by a civic, business or management executive. Seeger also was cited for his community involvement in such activities as the Pomona Job Fair for underprivileged children and the Southern California Gas Company Concern Program.

## Sterling Elected

Peter Sterling, Engineering Program Manager at Electronics Division, has been elected Chairman of the Aerospace Industries Association's Technical Management Committee.





**Navy Kudos.** Fort Worth engineer Sylvia H. Blair with medals and citation awarded to her by the Navy for assistance related to the F-14D upgrade.

## Engineer Blair Cited For Work on Panel On F-14D Upgrade

The U.S. Navy recently presented its Superior Public Service Award to Fort Worth employee Sylvia H. Blair in recognition of her contributions to a Blue Ribbon Panel chartered by Naval Air Systems Command.

Blair served for two months on the panel that addressed technical issues related to the Navy's F-14D upgrade program. The panel's recommendations and actions were critical in helping the Navy meet its schedule for the program. Grumman is contractor for the F-14D.

Blair's award citation notes "a cost avoidance for the F-14D program and a productivity increase" as direct results of the panel's findings. Rear Adm. Richard E. Gentz, Vice Commander of Naval Air Systems Command, presented the citation, signed by Navy Secretary William Ball III, and two medals to Blair during a ceremony in Washington, D.C.

The Superior Public Service Award is the second highest honor that the Navy can bestow on civilians.

Blair is currently an Assistant Project Engineer on Fort Worth's Advanced Tactical Fighter (ATF) program. She joined the division in 1979.

## Computer Software in Action at Land Systems Generates Interest Throughout the Company

Computer software introduced in 1987 as part of the Land Systems multiyear program is generating interest throughout the corporation.

Three Convair representatives and one from Pomona recently made a two-day trip to Michigan to see the Variation Simulation Analysis (VSA) and Computer-Aided Tolerance Analysis (T-chart) software programs in action.

"We kept hearing about these marvelous new computer tools that could simulate the manufacture and assembly of a product before actual buildup, and we had to see it for ourselves," said Charles Bennett, Chief of Manufacturing Producibility Pre-design at Convair.

"The two computer programs are a revolutionary development and advancement for the Land Systems manufacturing arena," said Robert E. Heath, Land Systems Manufacturing Engineering and Technology Chief, who served as cohost and took part in the presentation.

Heath said the T-chart software performs the tolerance charting function for machined parts with internal diagnostics and programs to find out-of-tolerance dimensions with an 80 percent increase in efficiency and accuracy. He said the VSA software simulates the assembly of a product to provide an accurate indication of actual production variation and design tolerances.

"VSA will provide a vital link between the design and manufacturing communities with its ability to predict variation within an assembly before buildup," Heath said.

Several success stories from different engineering disciplines were presented to the delegation.

Bennett said that, as a result of his trip to Land Systems, Convair Manufacturing Engineering plans to obtain and



**Interesting Software.** Robert E. Heath, Land Systems Manufacturing Engineering and Technology Chief (at keyboard), demonstrates the latest VSA software update to (left to right) David M. Moen, Quality Systems Specialist; Carl E. Engle, Production Engineering Chief; Lynda L. Eagle, Program Administration Specialist; and Albert J. Ash, Tool Engineer.

use both software programs.

"We have conditions now on existing programs and in pre-design for which T-chart and VSA would be great time-saving tools," he said.

## State Department Orders Multimission Caravan Is

The U.S. Department of State has ordered two Cessna Caravan I turboprop utility aircraft to fill a multimission role in its narcotics control, eradication and interdiction operation.

Mark S. Blair, Cessna's Manager of Government and Fleet Sales for propjet aircraft, said the two aircraft will be delivered to the State Department in April and May.

Blair said the Caravans will be used in a wide range of missions, including personnel and cargo transport, search and rescue, command and control, reconnaissance and aerial photography.

The big single-engine turboprops will be fully equipped for all-weather operations, including flight into known icing conditions. Long-range VLF-Omega navigation systems also will be installed.

The aircraft will be configured for nine passengers and

one pilot, using utility, fold-up seats that can be quickly removed for cargo operations. An easily removable cargo barrier is installed for crew protection and payload security in the cargo configuration.

A new, high capacity oil cooler is included to improve performance during operations in hot weather conditions or at high elevation airports when temperatures are high.

Blair said government procurement officials were impressed with the Caravan's established record of reliability and flexibility, as well as its low operating costs.

"They made it clear during the competitive evaluations that dispatch reliability and cost of operation were extremely important," Blair said. "In addition, the aircraft had to be easily adaptable to austere basing environments. The Caravan has demonstrated its ability to fill all those requirements."

## Environment-Friendly Paint System Being Used by Convair By Julie C. Andrews

Convair is using high-volume, low-pressure (HVLP) turbine air spray equipment to apply primers and topcoats to aerospace products — an innovation that is proving to be cost-effective and kinder to the environment.

"The HVLP turbine system has replaced the conventional air spray equipment in all Convair coating application areas," said Glenn R. Morris, Design Specialist-Materials and Processes Engineering. "The system atomizes the coating with a high volume of warm dry air at two to six PSI (pounds per square inch), in contrast to conventional air spray which uses low-volume compressed air at 35 to 75 PSI."

The turbine system greatly reduces the amount of overspray that misses the part and ends up on paint racks, spray booth surfaces or is emitted into the air to be collected by the spray booth exhaust system, Morris said.

"We can get coating transfer efficiencies of up to 80 percent with the turbine system, whereas a transfer efficiency of 35 percent is common with standard air spray systems," Morris said.

Material cost savings realized by using this equipment range from 35 to 50 percent.

The turbine HVLP system is a key element of Convair's Environmental Resource Management effort. "The system exceeds the 65 percent minimum transfer efficiency required by the Environmental Protection Agency regulations for applying coatings to ground equipment," said A. V. Skiles, Convair's ERM Manager. "This is a 40 percent improvement over conventional air spray systems. The system greatly reduces the amount of smog-producing solvents emitted into the atmosphere during spray applications of primers and topcoats."

Convair's Materials and Process Engineering group evaluated a number of painting systems and chose the

HVLP because it was the best system for applying military and commercial primers and topcoats to airborne and ground equipment. The system is able to accommodate the variety of coating applications for Convair's product mix from topcoats on the Tomahawk cruise missile to individual detail parts, large subassemblies for the MD-11 fuselage and ground support equipment.

The turbine HVLP system can apply coatings to conductive and nonconductive parts. Thus, it can cover metal materials, which are conductive, and composite materials, which are nonconductive. It is also safe to use on electronic components. The system requires a minimum of operator training and reduces production cure times.

"After receiving classroom training on the turbine air painter, an experienced production painter can easily become proficient with the turbine air spray gun after six to eight hours of production use," according to Frank J. Glenski. Glenski is a manufacturing engineering specialist in Convair Operations Product Development and Support who helped train the operators. "The turbine spray system allows the painter to apply the required amount of paint faster and more efficiently while keeping the work area cleaner," he said. "The painters really appreciate this."

Convair uses 18 turbine HVLP spray units that are mounted on mobile carts for easy maintenance and transportation from one spray area to another. Turbine air manifolds have been installed in paint booths to deliver turbine air from the turbine situated outside the booth to a valve/regulator assembly in the booth. Each turbine can be used to supply four spray guns through the manifold system.

The mobility and efficiency of the turbine HVLP system are especially valuable for the coating of some of the larger

MD-11 fuselage assemblies that cannot be brought into the paint booths. The cart can be brought directly to the MD-11 production line.



**Painter Gregory P. Bini Uses Turbine Spray Gun**



## Women and Minorities Get a Boost in Careers at Valley Systems By Jerry Littman

Six Valley Systems employees have started the division's first two-year Career Enhancement Program designed to identify and prepare upwardly mobile minorities and in order to broaden their career paths.

The program includes two major components.

- Education. The requirements are designed to fit the needs of each participant.

- Rotational work assignments. The assignments are designated by each participant's home director, with the approval of a management committee.

The participants in the program are:

**Victoria E. Brown**, Executive Secretary to Lenard M. Stuessel, Division Vice President - Production;

**Anita F. Evans**, Secretary to James J. Swenson, Manager - Information Services, and Walter F. Evans, Site Manager - Data Systems Division;

**Bridget A. Gomez**, Manufacturing Analyst in the Receiving Department;

**Colleen M. Hope**, Executive Secretary to G. Pat Thacker, Deputy Program and Production Director - RAM and Launcher Systems;

**Anne E. Serra**, Publications Specialist in the Publications Department; and

**Beth E. Wahl**, Senior Design Engineer on loan to the RAM program from the Engineering Department.

Brown joined General Dynamics at Pomona in 1981 as a clerk and later advanced to Secretary and Executive Secretary. She transferred to Valley Systems in 1986. Brown currently attends Chaffey Community College and plans to transfer to a four-year college or university.

Evans started her General Dynamics career at Valley Systems in 1986 as a stenographer-secretary, and later in the same year she advanced to her current position. She received an Associate in Business degree from Skadron Business College and is now attending Chaffey Community College.

Gomez joined General Dynamics at Pomona in 1982 as an office clerk senior in the Receiving Department. She later advanced to Material Release Analyst and Material



**First Career Enhancement Program.** Members of Valley Systems' first Career Enhancement Program observe as Ronald D. Kapper, Stinger Program Manager for Engineering, discusses Stinger. The six employees who were selected for the program are (from left) Victoria E. Brown, Anne E. Serra, Anita F. Evans, Colleen M. Hope, Bridget A. Gomez and Beth E. Wahl.

Release Analyst Senior. She transferred to Valley Systems last year and is currently attending Mt. San Antonio College, where she is majoring in supervision.

Hope joined General Dynamics in 1980 as an office clerk for the Pomona Recreation Association and later joined the Contracts Department as a stenographer-secretary. She transferred to Valley Systems about a year ago. She received a Certificate of Achievement in Business Administration from Chaffey Community College and has almost completed requirements for a Certificate of Achievement in Management. She is also working toward an Associate in Science degree, majoring in business administration and management.

Serra has been employed at Valley Systems in the Publications Department since 1982, starting as an engineering writer and later advancing to Editor and Publications Specialist. She has attended Sullins College in Bristol, Va., and graduated from Ohio State University with a Bachelor of Arts degree in General Studies.

Wahl joined General Dynamics in 1974 as a draftsman at Electric Boat and remained there for three years. In 1986, she joined Valley Systems as a design engineer and was promoted to Senior Design Engineer earlier this year. She has attended Orange Coast College and received a Bachelor of Science degree in Mechanical Engineering from California State University at Long Beach.

## Abrams Proves Its Water-Fording Capability on Virginia Shore By Jack M. Price

With the sea lapping 10 inches from its open commander's hatch, an M1A1 Abrams tank surged through the Atlantic surf off the coast of Virginia to prove out a water-fording kit designed by Land Systems for the U.S. Marine Corps.

With Marines as a crew, the tank drove flawlessly from the landing craft through several hundred yards of choppy water to the beach at the Little Creek Navy Amphibious Base. The ride proved the capability of the kit to allow the Abrams tank to ford 78 inches of water.

The successful demonstration of the kit satisfied a final requisite of the Marines for the purchase of Abrams tanks and all but ensures production of 400 M1A1 tanks for delivery to the Marine Corps starting in November 1990.

Brig. Gen. G. L. Cates, Deputy Commander of the Marine Corps Research, Development and Acquisition Command, watched the tank's performance and then strode across the beach to congratulate the crew. He then turned to Mark Stein, Land Systems Program Manager for Development. "We have a winner here," he said. "It does everything it is supposed to do."

The fording operation culminated the Land Systems design, development and testing of an M1A1 deep-water capability for the Marine Corps. The effort started 12 months ago with a contract to design and prove the capability for the M1A1 to ford in 78 inches of water and then operate on land with no significant degradation of performance.

The Land Systems staff under Darrell Duszka provided intake towers for the needed air to the powerful turbine engine.

A unique system of lanyards permits the bulky portions of the kit to be jettisoned by slightly rotating the tank turret. The tank and all its subsystems are then fully operational. The jettisoned parts can be retrieved by support troops and reused.

Minor permanent changes to the tank to accept the fording kit include a new exhaust seal to minimize leaks

when the exhaust plenum is applied, special seals for intakes and exhaust, plugs for the gun tube and heater exhaust and small modifications to the air intake channels.

The requirement for installation of the kit in less than two hours by a three-man tank crew was also demonstrated before the sea trials.

The Army, which reported that it is pleased with the performance of the kit, agreed to a common M1A1 tank production configuration with the Marines. This common configuration will not only reduce production and support costs, but will also give the Army a river- and stream-

fording capability to a depth of more than six feet.

In addition to the kit and changes to the tank, Land Systems produced a technical manual for kit application and removal, developed kit component packaging criteria and computed provisioning requirements for support of the deep-water-fording kit parts.

Several days after the demonstration, Dusan Rudes, Land Systems Project Manager for USMC programs, was presented a Land Systems award for his dedication, management skills and technical expertise in bringing the program to a successful and timely completion.



**Offshore Test.** Undeterred by choppy Atlantic seas, an Abrams tank, manned by a crew of U.S. Marines, moves several hundred yards from a landing craft to the Virginia beach at the Little Creek Navy Amphibious Base to prove successfully the deep-water-fording kit designed by Land Systems.

## Venezuela Honors Fort Worth Employees for Work in Its F-16 Program

The Venezuelan Air Force recently presented its Honor of Merit medal to three General Dynamics employees in recognition of their contributions to Venezuela's F-16 program.

Robert M. Drewry, Fort Worth's F-16 Program Director for Venezuela, J.S. Jayroe, F-16 International Market Development Manager at Fort Worth, and John J. Staud Jr., who formerly was employed as General Dynamics

Services Company's Director of Domestic Operations, were honored in a formal ceremony held in conjunction with the five-year anniversary of the Group 16 unit, which flies and maintains Venezuela's Fighting Falcons.

Drewry has been associated with the Venezuelan program since 1981. Jayroe has been involved with the program since its inception eight years ago. Staud was formerly GDSC's in-country Program Manager for Vene-

zuela, leading the Contractor Interim Support team that assisted the nation's air force as it assimilated the F-16 into its inventory.

They were honored for their dedication and professionalism in supporting the program and the readiness of Venezuela's F-16 fleet.

Venezuela has ordered and received 24 F-16s.



## Land Systems, Army Negotiating Clause In Value Engineering

Land Systems is negotiating a contract modification with the U.S. Tank Automotive Command that will make it the first General Dynamics division to have a funded Value Engineering Program Requirement clause in a government contract.

All General Dynamics divisions have been operating Value Engineering under the general incentive clause of the Federal Acquisition Regulation. Valued at \$4 million, the new clause will spell out a specific requirement for Value Engineering in the M1A1 Abrams Tank Program.

In the six years that Land Systems has been operating a Value Engineering program, the Army has approved \$41.7 million in Land Systems' Value Engineering changes.

"This addition to the contract will show further concrete evidence of Army support for cost reduction through Value Engineering and provide new funding for major Value Engineering projects that were previously on hold," said Jack R. Ondrus, Value Engineering Manager.

Land Systems submitted the contract change in a proposal at the request of the Army. Discussions on specific contract language and funding are under way.

"It's taken us more than 12 months to get to this point with the new Value Engineering clause," said Gregory J. Tomaszewski, M1 Deputy Program Manager. "But benefits for General Dynamics and the U.S. Army will be seen for years."

### Our Commitment To Our Shareholders

- *We will pursue our growth and earnings objectives while always keeping ethical standards at the forefront of our activities.*

(From the General Dynamics Standards of Business Ethics and Conduct.)



**Stretching for Weight Reduction.** Thomas J. Dinkelman, an engineer at Land Systems, uses an Instron Universal Testing Machine to test the strength of elastomer rubber. The machine measures a material's strength by stretching the material to its breaking point. Land Systems research on the use of composite materials identifies increasingly stronger but lighter materials that might be used in the M1A1 Abrams main battle tank. Composite materials tested daily at Land Systems could eventually be incorporated into the armor package or other metal components of the tank.



Consolidated's P2Y-1 Made Aviation History with San Francisco-to-Pearl Harbor Flight

## General Dynamics Flashback

### P2Y Was Long-Range Champ in 1934 By Myron R. Holtzman

President Franklin D. Roosevelt termed it "the greatest undertaking of its kind in the history of aviation . . . a magnificent accomplishment."

The President was referring to a squadron of Consolidated P2Y-1s on a flight that today might seem commonplace. However, by 1934 standards, the journey of the P2Y-1s was one of significant and historic proportions.

The squadron had just crossed the Pacific Ocean from San Francisco to Pearl Harbor in the Hawaiian Islands, a 2,408-mile flight that took 24 hours and 56 minutes — the longest overwater formation flight ever recorded to that point by a squadron.

It was a flight that was to change the course of naval aircraft development for years to come as the design of the P2Y-1 became the forerunner of the PBY Catalina, which served the U.S. Navy so superbly in World War II.

In April 1924, Adm. William Moffett, Chief of the Navy's Bureau of Aeronautics, planned to develop the first nonstop West Coast-Hawaii flight by Navy flying boats. Several PN-9s tried the distance, only to fall short of their destination.

Meanwhile, Reuben Fleet, the founder of Consolidated Aircraft Corporation, ancestor of Convair, set his sights on the task. Even though Consolidated had never before bid on a flying boat, Consolidated had the advantage of its design chief, Mac Laddon, who had had previous experience working on large aircraft and the PN-9.

The Navy furnished specifications and Laddon and his 30-man crew worked on Consolidated's design. The corporation was awarded a \$150,000 contract in February 1928 for the design of its prototype flying boat, the XPY-1 — "X" for experimental, "P" for Patrol and "Y" for Consolidated (first rights to "C" having gone to Curtiss years before). Fleet, however, called it the "Admiral" after Moffett.

The Admiral had a 100-foot wingspan and pontoons 14 feet on either side of the 62-foot-long hull, supported by struts from the hull and wing. Twin 450-horsepower Pratt and Whitney engines were strut-mounted between the parasol wing and the hull, while twin vertical fins were set atop a 21-foot horizontal stabilizer.

The plane had a five-man crew: a pilot and copilot in an open cockpit, a navigator-bombardier in an open hatch in the nose, a radioman in the hull and a mechanic who doubled as a gunner, firing a .30-caliber machine gun from an open hatch in the hull midway between the wing and tail.

The original specification, a cruising speed of 100 mph, was met. When a new directive came for a 135-mph speed, a third engine was mounted atop the wing, but it produced little added speed. The flight test was such a success, however, that the 135-mph edict was eliminated.

Consolidated had built a unique flying boat. Although its cost exceeded the contract by \$500,000, Fleet felt he could recoup the money on the rest of the production models.

However, it was the Navy's custom to competitively bid projects to keep costs at a minimum. And even though Fleet never allowed Consolidated to bid on another manufacturer's design, he found himself in financial straits when the Navy accepted the Glenn L. Martin Company's low bid for the rest of the project.

Undaunted, Fleet simply converted the Admiral to civilian use. With relatively few changes, the Model 16 Commodore was born — the largest, longest flying boat on the market. The Commodore turned out to be the luxury airliner of its day, complete with decorated, comfortable interiors. In the end, Fleet turned his \$500,000 deficit into a \$250,000 profit.

Meanwhile, Consolidated was improving its XPY-1 design. The most noticeable difference was a small lower wing, making it a sesquiplane (1½ wings). Floats were tucked under the short wings, along with provisions for carrying up to 2,000 pounds of ordnance. In 1931, the Navy ordered 23 of the planes.

The P2Y could fly 3,000 miles nonstop. In September 1933, Patrol Squadron 5F delivered six planes to Coco Solo in the Panama Canal Zone, flying the 2,059 miles in 25 hours and 20 minutes. That bettered the old mark of 1,864 miles set in 1933 by Italo Bilbo's Italian Squadron, which had flown the South Atlantic from Africa to Brazil.

In January 1934, the squadron flew to Acapulco, Mexico, and then to San Diego in preparation for its flight to Hawaii, a mission flown several times before by single planes, but never by a squadron.

The group, under the command of Lt. Cmdr. Knefler McGinnis, took off on Jan. 10th and headed west through the Golden Gate. (The new bridge was under construction at the time.) The squadron flew at altitudes of 500 to 5,000 feet through the night in a thick overcast. By dawn, visibility improved and by noon the formation swept past Diamond Head and flew into Pearl Harbor.

The planes dipped their wings upon passing John Rodgers Field, named in memory of the first naval officer to essay the route in 1925. Some 1,500 persons were on hand to greet the squadron, whose accomplishments were proclaimed worldwide.

The flight helped promote Consolidated's reputation as a leader in aircraft manufacturing and helped lead to its eventual merger with General Dynamics as Convair on April 30, 1954.

## West Coast Divisions Revise Supplies System

In a move aimed at reducing inventory and material support costs, Convair has contracted for a new stockless warehousing system for office supplies. The system will benefit all Southern California divisions including Convair, Space Systems, Electronics, Data Systems Division-Western Center, Valley Systems and Pomona.

Under the new system, an outside supplier will warehouse all commonly used stationery supplies. Department employees will order supplies at designated in-plant locations and be able to pick them up the next day.

Russ N. Babcock, Convair Vice President of Procurement, said, "This is one of several initiatives we have

undertaken to improve our processes to be more responsive and cost competitive. We will benefit from better service, reduced inventories and lower operating cost."

The new system will reduce the need for warehousing space. The supplier will warehouse and manage the inventory and report expenditures back to the company on a monthly basis. There will be no need for internal material control numbers, tracking systems or paperwork.

Based on this first step in stockless warehousing, Convair is looking at converting internal forms, paper supplies and, finally, janitorial supplies to the same system.



## Dietzmans Help Save Marriages Through 'Encounter' Program By Dave Lange

Working, attending school and raising a family left Ron and Melissa Dietzman little time for each other. And then they heard about National Marriage Encounter.

Their lives haven't been the same since.

Dietzman, Training Administrator at Valley Systems, and Melissa attended a weekend encounter in November 1980. The program so benefited their marriage that they volunteered their time to enable others to participate. They help organize encounters in Southern California with other volunteer couples such as their close friends, Paul and Lynn Beal.

The encounters are for marriages good and bad, old and new, affluent and poor. The non-profit organization sets up encounter weekends at hotels and retreat houses where spouses spend Friday night through Sunday afternoon talking to each other about their lives together.

"You come off the weekend changed," Melissa said. "Your family and friends will look at you and say, 'What happened?' You're so excited about the weekend that you have to tone it down because when you tell someone about it, they say, 'Right, sure. Prove it to me.' But it's something you can't explain. You have to experience it."

The Dietzmans are one of two or three "presenting" couples and the Beals are the clergy couple who staff a weekend session. They take turns giving brief talks and readings to the 12 to 20 couples who register at each encounter. The presentation ends with a question; the husbands and wives separate, write their answers, then

reunite in their rooms to privately discuss what they've written. Sharing that discussion in front of the group is voluntary.

"It sounds easy, but you'd be surprised at what you can find out," Lynn Beal said. "Sometimes it rains. Sometimes a fire alarm goes off."

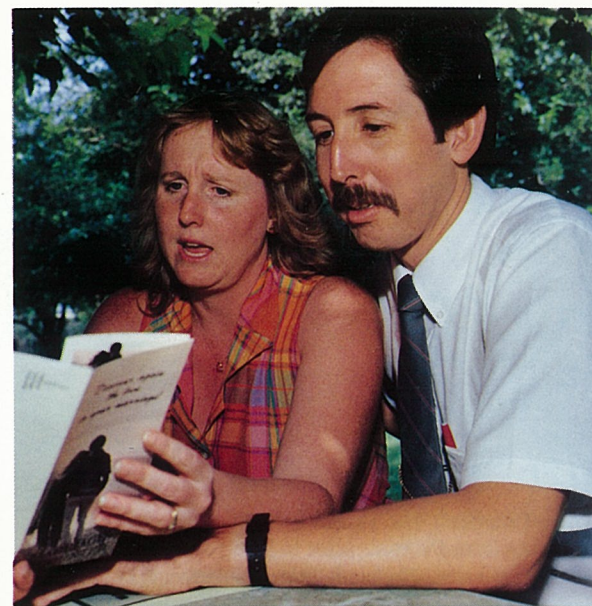
"And sometimes there's an earthquake," Ron Dietzman said.

The Dietzmans present about two or three encounters a year and have served in executive posts in the South Coast Community of California Marriage Encounters, a chapter of the national organization. Because Paul Beal is a minister, Lynn and he are in great demand as a clergy couple and have helped put on as many as five weekends a year.

Presenting couples, such as the Dietzmans, draw on their experiences to speak on a topic, which can range from the emotional — how do you feel when I kiss you — to the practical — who pays the bills.

Paying the bill for attending an encounter is voluntary. The only required payment is a registration fee, although couples are asked to donate what they can to cover costs for rooms, meals and materials.

But whatever the cost, the chances of positive results are worth it. It's not uncommon for couples to show up on Friday with plans to go separate ways Sunday night if the weekend encounter doesn't turn them around. "What we



**Encounter Couple.** Valley Systems Training Administrator Ron Dietzman and his wife, Melissa, help plan and present marriage encounter weekends in Southern California.

tell people is an encounter isn't something they need," Melissa said. "It's something they deserve."



**Flying Razorbacks.** F-16s of the Arkansas Air National Guard's 188th Tactical Fighter Group, the Flying Razorbacks, take to the air after the group officially accepted its first F-16s in a recent ceremony at its Fort Smith Municipal Airport base. The F-16 activation was held in conjunction with a base open house attended by thousands of local residents and included an F-16 fly-by and high performance aerial demonstration. The ceremony was attended by the Arkansas Air National Guard's adjutant general, Maj. Gen. James Ryan, and several Arkansas government officials. A total of 10 Air National Guard and two Air Force Reserve units now fly the Fighting Falcon.

## Land Systems Joins in Training Program

Land Systems recently became the fourth General Dynamics division involved in the military's Training-With-Industry (TWI) program when Capt. Johnny L. Baker Jr. became its first TWI student.

Captain Baker was one of 57 U.S. Army officers selected to spend a year with leading defense contractors and service agencies. The U.S. Army and the defense industry have participated in TWI for more than 10 years.

Fort Worth, Pomona and Convair also participate in TWI programs.

Officers are selected on their performance, potential and related specialty requiring a particular type of training

and experience. The Army and Air Force have programs designed to give their officers more knowledge and understanding of the products purchased for their branches of service. Upon completion of the program, the officers are awarded a certificate equivalent to an advanced degree related to their service specialty.

Captain Baker will be assigned to a number of Land Systems functions, including Manufacturing, Quality, Material Control, Engineering and the Program Office. His training will be coordinated by William T. Ondrus, Manager of Human Resources Development.

## Detroit Tank Plant Quality Manager Gets Excellence Award

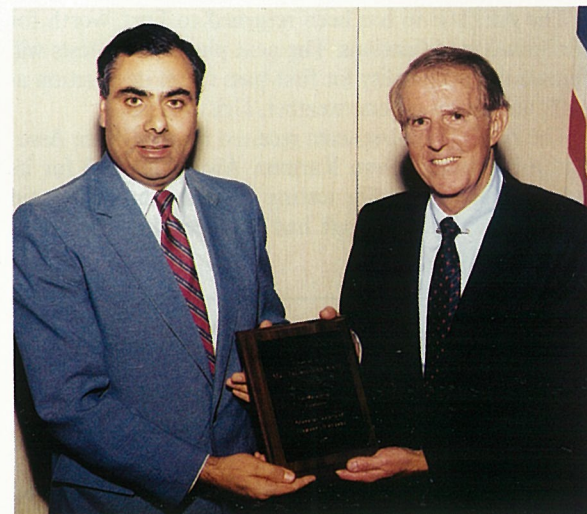
Jag (Bushan) Kaul, Manager of Quality Assurance at the Detroit Arsenal Tank Plant, recently received a Managerial Excellence Award from the American Society of Engineers from India (ASEI).

Each year the ASEI recognizes a manager, an engineer and a student who have displayed excellence during the previous year. Kaul was selected from a large group of candidates for his innovative leadership of the Quality Assurance Program at Detroit.

"Bushan's aggressive management style has helped the Detroit Arsenal Tank Plant's Quality organization exceed multiyear savings goals," said Eric E. Smith, Land Systems Vice President-Quality. "He has effectively allocated reduced resources while still maintaining the highest quality and performance levels of tanks in the field."

Smith added that Kaul's management style and desire to pass on quality knowledge to others have developed sound customer relations, both domestically and overseas. "Whatever the challenge, Bushan creates a team environment through motivation and effective communication so that division commitments are continuously exceeded," Smith said.

Kaul has been with the company since 1977.



**Excellence Award.** James R. Mellor, Executive Vice President-Marine, Land Systems and International (right), presents Jag (Bushan) Kaul, Manager of Quality Assurance at the Detroit Arsenal Tank Plant, with a Managerial Excellence Award.

## Caravan I to Provide Canadian Cargo Service

Cessna Aircraft Company's Caravan I Super Cargo-master has been selected by a new Canadian company to provide high priority express cargo service to the Atlantic provinces.

Provincial Express Inc., based in St. John's, Newfoundland, took delivery of its first two Caravans in October, and service throughout Newfoundland, Labrador and Nova Scotia began in November.

Roger W. Pike, Chairman and Chief Executive Officer of Provincial Express, said the big, single-engine Caravan turboprops will serve many small communities that can be

reached only by air from November to June.

"During our evaluation flights in remote areas last winter, we determined that the Caravan is the only aircraft that can do the job we need to do," Pike said. "We were very impressed with the Caravan's ability to fly heavy loads in and out of rough, 2,500 foot strips in virtually any weather."

The Caravan I is the only single-engine aircraft certified to carry the mail in the United States and Canada during instrument flight conditions.

## Radome Subcontractor Selected

Radant Technologies, Inc., a small business in Stow, Mass., has been selected to design, develop and test the radome for the U.S. Navy's A-12 Advanced Tactical Aircraft. General Dynamics and McDonnell Douglas are the prime contractors for the A-12 program.





**Trident Assisted.** The Trident submarine *Tennessee* (SSBN 734) was delivered ahead of schedule to the U.S. Navy Nov. 18th after successful completion of sea trials. The submarine is shown returning from the trials prior to being docked at the Electric Boat shipyard on the Thames River. *Tennessee* is the nation's newest and most advanced *Ohio*-class Trident ballistic missile-firing submarine. The ninth Trident submarine built by Electric Boat, she is the first to carry the Trident II missile.

## AFTI/F-16 Shows Close Air Support's New Technologies

The U.S. Air Force demonstrated new technologies for the close air support (CAS) mission with the Advanced Fighter Technology Integration/F-16 (AFTI/F-16) aircraft during recent flight tests in California.

The aircraft's Automatic Target Handoff System (ATHS) was used to provide target locations to the pilot by digital data link without voice communications. The information was automatically transmitted to the aircraft's fire control and navigation computers, eliminating the possibility for confusion when voice communications are jammed or misunderstood.

"Such clear, precise communication can improve the aircraft's survivability during close air support operations," said Michael R. Griswold, Fort Worth's AFTI/F-16 Chief Engineer.

"When the pilot has accurate navigation data and needs to make only one pass to destroy a target, it greatly reduces the aircraft's vulnerability to ground fire," he said.

The AFTI/F-16's digital terrain management and display system and integrated flight and fire controls were also applied to the CAS mission in the tests. The testing phase also evaluated the performance of an infrared laser sensor-tracker and helmet-mounted sight.

The tests were conducted at Edwards AFB, Ft. Irwin and the Superior Valley Tactical Range. Tests at Superior Valley proved the capability of the ATHS to pass data directly from Army scout helicopters to forward air controllers and the AFTI/F-16.

The tests at Ft. Irwin included five target runs against typical CAS targets such as ground vehicles, air defense sites and bridges, said Maj. Myres N. Drew, the Air Force's AFTI/F-16 Program Manager.

The AFTI/F-16 has been returned to Fort Worth for additional modifications. The next phase of the tests will demonstrate capability for first-pass target destruction at night and under adverse weather, Griswold said.

The AFTI/F-16 test team received the Air Force Association's Theodore von Karman Award in 1987 for its achievements in earlier testing phases. The AFA said advances with the aircraft had "pioneered a new era in aviation history."

## A-12 Is Called Navy's No. 1 Air Priority

Vice Adm. Robert F. Dunn, the Navy's top aviation officer, described the A-12 program as naval aviation's "number one priority" during a recent visit to Fort Worth.

In a speech to the National Management Association, Admiral Dunn said the A-12 Advanced Tactical Aircraft (ATA) will "write new chapters in naval aviation history."

He also said the aircraft "represents the next significant step toward the future" with capabilities that will allow it to easily fulfill its carrier-based attack mission. He added that General Dynamics employees will be proud of the A-12, even though most won't see it for some time because of security restrictions.

"I'm impressed with the way the A-12 team has gotten under way . . . combining the strengths and talents of two major aerospace companies," he said, referring to the General Dynamics/McDonnell Douglas joint program.

## Cessna Aircraft Schedules Giant Citation Airlift For Summer Special Olympic Games in 1991

Cessna Aircraft Company will once again stage a massive airlift of Citation business jets to transport athletes to the VIII International Summer Special Olympic Games, which will be held in Minneapolis in 1991.

"More than 130 Citations flew almost 1,000 athletes to the summer games in South Bend, Ind., in 1987," said Russell W. Meyer, Chairman of Cessna. "In 1991, we expect to expand the airlift to include at least 200 to 250 Citations, which will enable us to fly 1,500 to 2,000 athletes to Minneapolis."

In addition to the airlift, Meyer announced that Cessna, through a Citation demonstration program, hopes to offset the airline transportation costs of the other 3,000 athletes who will compete in Minneapolis.

"For every individual or company that takes a demonstration flight in a Citation as a result of this program, Cessna will provide round-trip transportation for one athlete from that area to the International Special Olympics Games," Meyer said. "If the demonstration flight leads to the sale of a Citation, we will underwrite the cost of transportation for 10 athletes."

Meyer said a Citation Special Olympics Trust Fund will be created, which will be payable to the Special Olympics organization in 1991. "Our goal is to create a fund of at least \$500,000 to help offset the transportation costs for the other 3,000 special athletes who will travel to Minneapolis by commercial airline," he said.

The first Citation Special Olympics Airlift in 1987 was described as the largest peacetime airlift in history and one of the most intensive volunteer efforts by American business in behalf of a public cause.

The entire delegations of athletes and coaches from 12 states east of the Rocky Mountains were airlifted to South Bend from 16 cities. On July 31st, for more than six consecutive hours, a Citation took off somewhere every three minutes, carrying four to eight Special Olympians. In South Bend, arrivals and departures were sequenced at 90-second intervals. So closely was the complex flight planning followed, the last of the 132 aircraft, scheduled to land at 3:12 p.m., touched down at Michiana Regional Airport at 3:16.

One week later, the airlift was repeated in reverse when the Citations returned to South Bend to fly the athletes home. The aircraft and crews had been donated by corporations in 31 states and Canada, most of them volunteering to fly long distances to position their aircraft where they were most needed.

"It was difficult to tell who enjoyed the airlift the most, the athletes or the Citation crews," Meyer said. "It was the first airplane ride for most of the athletes — and virtually all the pilots were flying their first mass airlift. Most of them have already said they want to be a part of the fun again in 1991."

## Gold Medalist Spalding Watches Ball Closely In Completely Quiet Game of Tennis

By Joe Stout

Fort Worth's Diane K. Spalding hopes to represent the United States next year in the Olympics. That's right, next year.

Spalding has been named to the U.S. tennis team of the 16th World Games for the Deaf, which will be held in January in New Zealand.

It would be her fourth Deaf Olympics competition and a chance to win a third gold medal. She has also won two silver and two bronze medals in previous Deaf Olympics competitions, and the Maere Cup, which is described as the Davis Cup for the deaf, four times in other international meets.

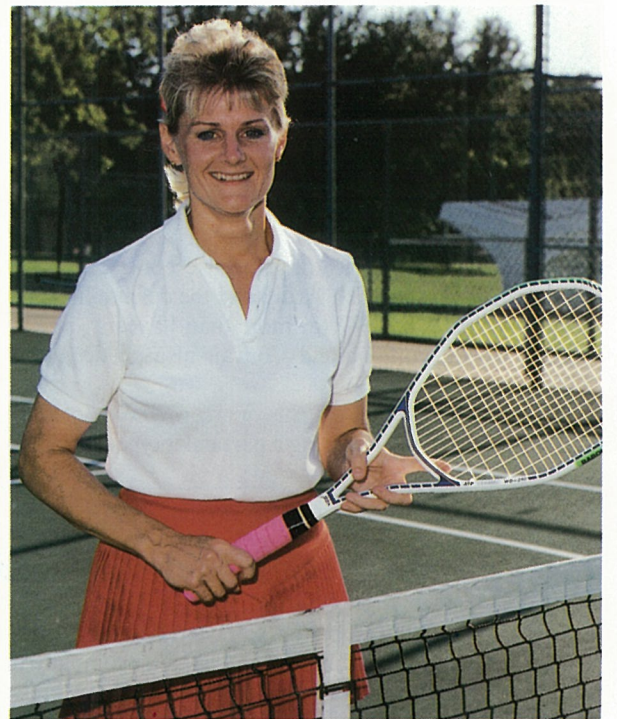
Spalding, a technical analyst in the Operations Analysis group of Fort Worth's Flight Simulation Laboratory, began playing tennis at 14 in her hometown of Wichita Falls, Tex. She played on the varsity throughout high school and learned about the Deaf Olympics while attending Gallaudet University in Washington, D.C.

Following college, Spalding directed a Tennis for the Deaf program in Houston for a year. She has also taught at Camp Sign, a summer camp operated by the Texas Commission for the Deaf, and currently teaches tennis to hearing-impaired children and adults through the Fort Worth Association for the Deaf.

Deaf tennis players must watch the ball closely, since they have no sound cues, said Johnny Simmons, director of Hamilton Park Tennis Center in Wichita Falls.

Spalding's brother, Chris, is also a member of the U.S. team for the Deaf Olympics.

Members of Deaf Olympics teams pay their own travel and lodging expenses, unlike participants in the regular Olympics. Several of Spalding's coworkers at Fort Worth



**Fort Worth's Diane Spalding, Deaf Tennis Champion**

are assisting with outside fund-raising activities, and the division's National Management Association chapter has agreed to help with advertising. "We think it would be great to see her go and win," said coworker Michelle Skrzypczak.